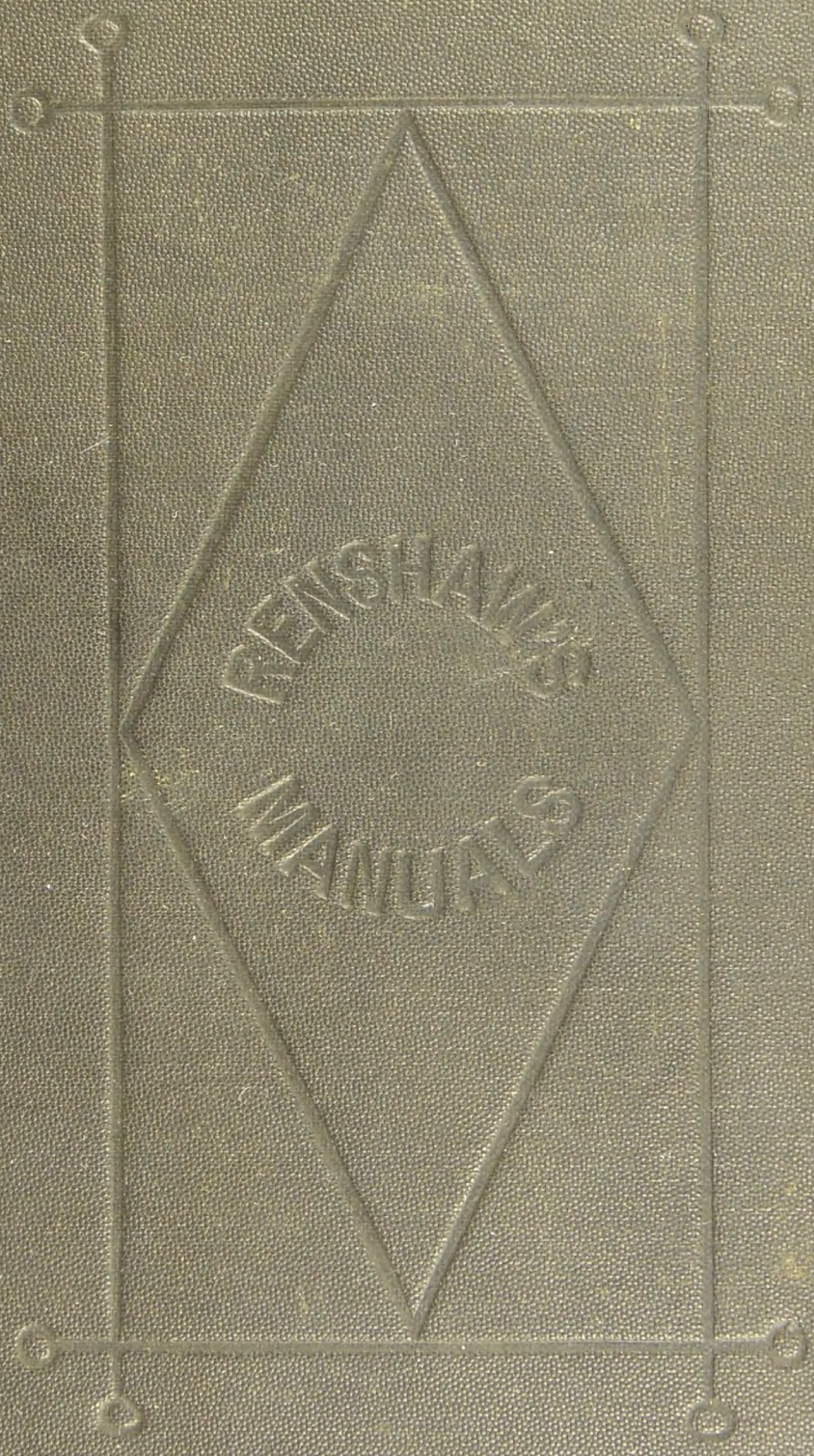

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A DICTIONARY

OF

TREATMENT;

OR,

THERAPEUTIC INDEX,

INCLUDING

MEDICAL AND SURGICAL THERAPEUTICS.

BY

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TO

PROFESSOR GAIRDNER, M.D., LL.D.,

IN RECOGNITION OF

HIS EMINENCE AS A PHYSICIAN, CLINICAL TEACHER AND SCIENTIFIC OBSERVER, OF HIS CULTURE AND ERUDITION, OF HIS GOODNESS OF HEART AND NOBILITY OF CHARACTER,

This Work is Dedicated

BY

HIS FRIEND THE AUTHOR.

PREFACE.

THE issue of each edition of the writer's work on Pharmacy, Materia Medica and Therapeutics, brought suggestions from many members of the profession, both teachers and practitioners, upon the necessity of appending to it a Therapeutic Index, or Index of Diseases, for reference. With the view of acting upon these suggestions, and of furnishing the practitioner and student with a complete list of drugs suitable for the treatment of the various diseases, a Therapeutic Index, such as forms a portion of nearly every modern work on Materia Medica, was commenced. It soon, however, became evident that the practitioner or student would be assisted but little by a mere enumeration of the drugs suitable to the treatment of each affection, unless the list was accompanied by some expression of opinion regarding the relative value of each drug, and of the different methods by which it might be employed.

What was at first undertaken with the intention of being compressed into 50 or 60 pages, has gradually grown into a volume of nearly 1000 pages, and the greatest difficulty was experienced at every point in keeping it within its present limits. The necessary condensation prohibited the discussion of pharmacological questions, and required the briefest reference to authorities, the writer having to remain content with giving the results of his own practical experience most concisely, before mentioning the various methods of treatment pursued successfully by others.

Surgical questions are treated for the most part briefly, but the writer has frequently expressed his own opinions, formed during several years of practice, when surgical methods formed the major part of his daily work, in conjunction with the late Professor Gordon.

He expresses his indebtedness to Mr. Victor Fielding, whose careful correction of the proof-sheets, and whose invaluable assistance in forwarding them through the press, made the issue of the present volume possible, amidst the interruptions and exactions of a laborious practice.

8 COLLEGE SQUARE NORTH, BELFAST, *December*, 1891.

TREATMENT OF DISEASES.

ABORTION.

The treatment of this condition will depend to a large extent upon the period at which the physician finds the patient for the first time. Thus remedial agents may be demanded in the early months of pregnancy at any of the following three stages:

1. If there be a history of one or a series of previous abortions, it will be necessary to take measures to prevent the expulsion of the non-viable fetus, and tide over the dangerous period, though no threatening symptoms may be present.

2. If symptoms of threatening abortion have already appeared.

3. If the process of expulsion has already made a fair start, and there is no prospect of saving the fetus.

1. If there be any reason to suspect syphilitic taint, a mild mercurial treatment should be commenced early and continued with circumspection and with intermissions till after the sixth month. Salivation should never be produced, and it is comparatively easy to keep the patient under the influence of the drug without in any way reducing the system, or affecting the general health. $\frac{1}{32}$ of a grain of bichloride of mercury three times daily in simple solution, or $\frac{1}{2}$ grain of gray powder in pill, morning and night, may be continued for a long time. Should distinct evidences of recent syphilis be present, active treatment with much larger doses must be commenced without loss of time, and the ordinary antisyphilitic measures, as in the case of common syphilis, must be kept up.

In dealing with a suspected tendency to abort in a patient who has had evidences of syphilis at a remote period, or in dealing with a case where a history is obtained of the disease in the male parent of many years previous, the physician may be able to form some estimate of the amount of mischief present by the way in which the remedy is borne, as will be mentioned under Syphilis. Where there is an active virus present, mercury often seems to spend its force upon it, and after the diseased condition is removed small doses appear to affect the system.

In cases where the syphilis has been of long standing, and mercurial treatment had been at one time properly pushed, iodide of potassium in large doses, say 10 grains three times a day, may be given with advantage, and especially if there be any kidney mischief. Iodide of

potassium is also valuable in those cases where no history of syphilis can be obtained, and in those cases of so-called fatty degeneration of the placenta 5 grains three times a day, in pill, may be given for several weeks. In this latter class chlorate of potash in moderate doses is of decided value. It should not, however, be given in renal cases.

Abortion having occurred once it is liable to be repeated, and some women acquire a *habit* of aborting—the expulsion of the fetus often occurring about the same time in each subsequent pregnancy. In these, as in the former class of cases, everything that might in any way cause excitement of the genital apparatus must be guarded against, and the dangerous period watched with care, and the patient kept in a state of absolute rest in bed at this time, and also at the time in which the ordinary menstrual flow might be expected to appear had she not become pregnant. After correcting flexions or versions, if present, the physician may keep the patient, who has acquired the habit of aborting, upon 3 grain doses of extract of viburnum, in the form of a pill, three times a day, or minute doses of mercury, or moderate doses of iodide of potassium or chlorate of potash, until the dreaded period has passes. Some authorities recommend small doses of ergot under these circumstances, but the writer never saw any benefit from such a plan.

2. If abortion already threatens, as evidenced by slight hemorrhage or some pains, an attempt should always be made to prevent it. Absolute rest, by keeping the patient flat upon a firm bed with light covering, is essential. Opium or morphia is the main drug to be relied upon, and may be given freely—1 grain of the watery extract of opium given every three, four or six hours as indicated. 3 to 5 grains of acetate of lead have been used by some, and 10 minim doses of tincture of digitalis, but their value is doubtful except when given in combination with opium. Where opium fails, morphia, combined with digitalis, may succeed. The writer has seen uterine hemorrhage stopped by this combination after the failure of all other remedies. Viburnum prunifolium or black haw is in great repute in America, and may be given in doses of 1 to 3 drachms of the fluid extract, or it may be given as just mentioned in the pilular form. (See author's *Materia Medica*, fifth edition, p. 620.)

The treatment of threatened abortion by minute doses of savin, ergot, and other supposed ecbolics, which are said to act as uterine sedatives when given in small doses, is to be condemned, as valuable time is lost by such an experiment. Hydrastis canadensis in 15 minim doses of the tincture is a valuable hæmostatic, and may be tried alone or with opium.

The physician must not place too much trust in internal remedies, and he should cease internal medication as soon as there is any evidence to show that the death of the fetus is probable. The danger of paralyzing the uterus by means of large doses of sedatives whilst a dead

fetus is contained in it, and the subsequent risk of septicemia, should be ever before him. Gentle and repeated examinations should be made from time to time as long as there is any bleeding.

3. If it becomes evident that abortion cannot be prevented, and that the fetus is still out of reach, the proper course to pursue is to give ergot, 30 minims of the liquid extract, every three or four hours, and plug the vagina with cotton-wool through a speculum, or, as practised by Spiegelberg, who inserts by forceps pledgets of cotton-wool with the right hand, keeping two fingers of the left hand held wide apart in the vagina, the plugs are inserted without any attached strings; each is greased with carbolized oil (1 in 5), and thrust well up against the os until the vagina is thoroughly packed. The vagina should be well washed out with an antiseptic lotion before plugging is commenced. The writer dispenses with this by freely covering the pledgets of wool with boric acid, and packing the spaces between the pledgets with this substance. The advantage of this is that the plug may not be removed for twenty-four to seventy-two hours, when the fetus and membranes almost always are found along with it. If by the end of three or four days the contents of the uterus are not expelled or within reach of the finger they should be removed, especially if hemorrhage to any extent be present. If this can be done by the finger thrust into the uterus no instrument should be employed, but sometimes the curette and scoop will be needed to remove all adherent portions of the membranes, after which the interior of the uterus should be swabbed with a strong carbolic solution, or with the pure acid, or with a solution of corrosive sublimate (1 : 5000). The plan of at once introducing the curette upon the first signs of hemorrhage, and of scraping the interior of the uterus and washing with sublimate solution, is not to be recommended as a routine practice. If symptoms of septic poisoning or of decomposition of the uterine contents set in, evacuation should be performed as soon as possible, and, if possible, always by the fingers, and the uterine cavity cauterized freely with pure carbolic acid, and antiseptic lotions or injections must be frequently employed afterward till the danger is passed.

Lawrence thus describes his method of dealing with a case of abortion which has gone beyond the expectant line of treatment—viz., rest, opium, etc. "Make the incomplete abortion complete by clearing out the uterus. Put the patient on her left side (Sims's position), wash out the vagina with carbolic lotion (1 : 100), pass a duck-bill speculum, take hold of the anterior lip of the cervix with Sims's hook, and pass up into the uterus a bougie of 20 grains of iodoform, then an antiseptic gelatin-coated sponge tent; retain this in the cervix uteri by a piece of iodoform wool in the vagina. In from twelve to twenty-four hours see the patient again. Remove the vaginal plug and sponge tent, both of which will be perfectly aseptic; wash out the vagina with the carbolic lotion, and now pass the finger into the uterus, and very likely you will be able to reach the fundus and clear out the contents. After

this wash out the uterus with carbolic lotion, and give directions for the vagina to be daily syringed. The great secret in the treatment is to clear out the uterus." Where the finger cannot reach the fundus it may be made to do so by retroverting the uterus through pressing the fundus toward the sacrum. Often when a catheter can be got through the os a stream of hot water may be injected. This may produce vigorous contractions which will expel the ovum, or the finger may be slipped through after the relaxation which afterward follows. When the curette is used, which should be seldom, a blunt one should be selected. Instruments for the extraction of the fetus or its membranes are not to be preferred to the finger.

Where hemorrhage follows the expulsion of the fetus and its membranes, it is likely that some portion of the placenta is retained, and this should be removed by dilatation and the finger and a free stream of antiseptic liquid.

After the expulsion or extraction of the fetus, the after-treatment should consist in the daily use of a vaginal antiseptic solution, rest in bed, milk diet, and the usual routine management indicated in the after-treatment of ordinary labor. As a rule, six or seven days' rest in bed will suffice for most cases in the absence of septic complications. Involution is not hastened by prolonged rest.

ABSCESS.

Where inflammatory action is present, constitutional or internal treatment may be tried to cause diminution or abortion of the suppurative process. Saline purges, large doses of quinine, 5 minim doses of tincture of belladonna, or $\frac{1}{10}$ grain of sulphide of calcium in pill may be given every three or four hours. The results are, however, generally disappointing. Locally, the suppurative stage may be cut short by rest, the application of alcoholic extract of belladonna, 1 drachm; and glycerin, 10 drachms, smeared over the part. Poultices, by dilating the capillaries and small bloodvessels, relieve tension, and may effectually prevent suppuration. Cold applications, by causing a diminution in the size of the small vessels, may check the process by cutting short the increased supply of blood. Elevation of the part sometimes secures the same result. By covering over the surface of a poultice with extract of belladonna, and keeping the patient in a horizontal position, threatening mammary abscess may be often prevented. Pain is relieved by these means if suppuration supervenes. Local blood-letting often gives relief, and may check suppuration.

If suppuration has already taken place, very warm poultices will hasten maturation, and hot fomentations act likewise. As soon, however, as pus is evidently present, a free incision with a fine double-edged blade will relieve pain and tension, and limit the spread of inflammation. By freezing the part with ether spray the pain of the incision may be prevented. The author finds that, by smearing the part

lightly over with the cork or stopper of the carbolic acid bottle, a sufficient amount of local anesthesia is obtained, and a certain degree of antiseptic effect is, at the same time, produced. The incision should be deep and free, and so made as to cause least scar and the best drainage. Where a small incision is desirable, the use of the aspirator is to be condemned; in such a case, a fine drainage-tube thoroughly disinfected may be inserted through an incision not much larger than the diameter of the tube. The part may be dressed with any of the following lotions, applied upon lint and covered with oiled silk:

1. Carbolic acid, 1 ounce. Water, 39 ounces.
2. Alcohol, 10 ounces. Water, 30 ounces.
3. Chloride of zinc, ¼ ounce. Water, 40 ounces.
4. Corrosive sublimate, 5 grains. Water, 40 ounces.
5. Permanganate of potash, 20 grains. Water, 40 ounces.
6. Boric acid, 2 ounces. Water 40 ounces.
7. Boroglyceride, 3 ounces. Water, 37 ounces.
8. Tincture of iodine, 2 drachms. Water, 39 ounces.

If any fetor exists, the cavity of the abscess may be freely washed out with the above solutions, and if unusually extensive, 50 per cent. of water may be added. For small suppurating cysts and abscesses in connection with diseased bone, solutions of double the above strengths may be used, or the cavity may be swabbed with lint soaked in solution of chloride of zinc, 1 : 10, pure carbolic acid, or iodized phenol (iodine, 1 ounce; carbolic acid, 4 ounces), and afterward washed out thoroughly with any of the above solutions.

A good plan is to apply a poultice of linseed meal, thickly sprinkled over with boric acid, immediately after the evacuation of the pus. A pad of salicylic, boric, or iodoform wool soaked in warm water may be applied. Abscesses in the neighborhood of sources of putrefaction, as about the anus, should be opened at some distance from the dangerous region, even though it should not be the most dependent spot. An incision should be made through the healthy skin a few inches distant, and a canal tunnelled to the sac of the abscess.

For chronic abscess (psoas, etc.), strict antiseptic precautions should be observed, free drainage by a tube, and, if necessary, counter openings should be made. (See Psoas Abscess.) In opening deep abscesses, especially in the region of large and important vessels, as in the neck and axilla, Hilton's method should be employed: An incision being made through the skin by a scalpel, the blades of a pair of dressing forceps are inserted deeply and then opened forcibly, so as to tear through the deeper tissues until pus is reached, after which a drainage-tube is inserted, and the wound dressed as before described.

For abscesses of ordinary size the writer has found the best routine treatment to be a large pad of well-teased carbolic tow laid over the wound, and secured by a slack bandage, and in cases where expense is to be considered, a similar pad of oakum will be found a splendid dressing. One dressing in twenty-four hours, even in profuse suppura-

tion, will generally be sufficient, as the pad can be made sufficiently large to soak up a large quantity of pus. A few shreds of the tow or oakum may be pushed into the cavity, and left projecting from the wound; in this way all the advantages of a drainage-tube may be obtained, and the lips of the incision are at the same time prevented from healing, and the sac allowed to granulate from the bottom. Where the abscess continues to discharge, the compound tincture of benzoin has been injected by the writer with great success. It often causes rapid healing, and is a powerful antiseptic, and produces little irritation or pain.

To treat acute and chronic abscesses by the strictly antiseptic method, an incision is made under the spray of carbolic lotion (1 : 20) by a scalpel purified in a similar carbolic solution, and after pressing out the contents of the sac, its walls may be well scraped with a sharp spoon and a purified drainage-tube inserted, and whilst the spray is still being played upon the part a large pad of carbolic gauze is laid over the wound *without* the intervention of the usual protective of oiled silk and copal varnish, and the whole covered with gauze dipped in carbolic lotion (1 : 30) and bandaged. Each change of the dressing should take place under the spray, and when there are any special reasons the carbolic gauze and lotion may be replaced by boric gauze and lotion, and should the skin become irritated, boric ointment (1 : 8) may be smeared over it under the gauze.

The tendency of modern surgery in the treatment of abscess is moving in another direction, and though the writer has no experience of the methods, the reports are so satisfactory that they will probably become recognized surgical procedures.

In America, Wile has successfully treated more than 100 abscesses in the following way—the method is practically the same whether the abscess be acute or chronic:—He inserts a large-sized aspirator needle into the sac, and to this he attaches a special little pump, and removes all of the contents possible. The sac is then filled quite full (moderately distended) with equal parts of water and a 20 per cent. solution of peroxide of hydrogen through the needle without removing it. Immediately the cavity becomes distended, and the accumulated gas and solution rush through the needle, carrying much *débris* with them. The pump is again applied, and everything removable pumped out. More solution is then injected and removed, till a perfectly clean cavity is obtained. A solution of corrosive sublimate (1 : 2500) is then injected and withdrawn two or three times, till a perfectly aseptic cavity is obtained. The needle is then removed, and over the site of the abscess a large pad of iodoform gauze is fastened by a bichloride of mercury gauze bandage, which is left *in situ* for from four to ten days, after which time he reports that he always finds complete closure of the cavity, perfect adhesion of its walls, and not a trace of the abscess left.

He reports that the patients are delighted that no knife is used, and

but very little pain produced. No after-dressing are required. No salves, solutions, and daily washings or dressings are needed for this simple, almost painless procedure, which causes a rapid cure and no cicatrix. The method is not applicable to multiple abscesses, or those situated in any of the great cavities of the body.

Bilroth opens tubercular abscesses freely, scrapes out all that can be removed, fills the cavity with 10 per cent. iodoform emulsion, and sews them up tightly again, with excellent results.

Bruns treats all tuberculous and joint abscesses in a similar manner. He aspirates thoroughly by inserting a needle into the sac or joint, and injects a sterilized 10 per cent. emulsion of iodoform in glycerin or olive oil. Into large joints he injects 2 to 6 c.c. at one or various points. All cold abscesses, spinal abscesses, and every joint abscess, as well as tubercular empyema, may be treated in this way.

Trendelenburg applies this plan to the treatment of all forms of local tuberculosis of soft parts, as of glands, testes, and lungs.

Verneuil treats all chronic or cold abscesses by aspiration and the injection of antiseptic solutions as just mentioned, his favorite agent being iodoform dissolved in ether.

Piechaud applies the same method to all acute abscesses, even if the skin over them be thinned and undermined. He aspirated by the ordinary aspirator, and then injects a solution of 1 : 1000 of bichloride of mercury, and reports that uniform success follows the plan.

It is obvious that of these methods there may be endless modifications to suit individual cases, and the plan of Wile is the most thorough, and gives the speediest results.

The injection, as carried out by Bruns, for tubercular abscess will require repetition every fourteen days, and sometimes oftener.

ACIDITY.

The distressing sensation following the regurgitation of acid liquid from the stomach in dyspepsia and other gastric affections is but a symptom of these affections, and its treatment should only be discussed as part of their therapeutics. It is, however, briefly referred to here for convenience and facility of reference.

It has been assumed that the very painful acidity coming on after a meal during the period of gastric digestion is caused by an increase in the amount of gastric juice secreted. The burning liquid which sets the teeth on edge and feels like vitriol as it regurgitates into the mouth is a mixture of butyric and lactic acids, often with some acetic. It is the product of decomposition, arising from fermentation in the sugar, starch, or fats swallowed, and, in most instances, it arises from delayed digestion caused by a deficient supply of gastric juice. It is, consequently, intensified by those remedies which diminish the amount of the digestive fluid.

The physician is often called upon, in an acute attack, to relieve the severe pain produced by the irritation of the acid. To give acids under

such circumstances is worse than useless. One *large* dose of an alkali gives immediate relief. The amount should be sufficient to neutralize the large and often enormous quantity of highly irritating, acrid acid present. Fermentation is at once arrested. 2 drachms of bicarbonate of soda or potash may be required, and the writer has given more than double this amount. If this should fail to give relief, an emetic must be administered.

These remedies, it is to be understood, are not to be often or habitually employed, or serious troubles may result; but when used they may be given unsparingly. Often at the beginning of what would become a painful attack, one large dose of lactopeptine, 30 to 45 grains, will dispel all uneasy sensation, and there is no objection to such treatment being frequently employed. Papain is more valuable, as it may be given with full doses of alkalies, whilst pepsin will only digest with acids. In very chronic cases, and especially where the fermentation is dependent upon some organic lesion, such as obstruction at the pylorus, all treatment fails, because the stomach still retains some ferment when the fresh food is swallowed, and thus the process is kept incessantly going on. In such cases, very satisfactory results will be obtained by washing out the stomach thoroughly with a weak solution of boric acid or Condy's fluid. The writer has seen pain and acid vomiting disappear, never to return, after having withstood everything prior to this treatment. Having relieved urgent symptoms, remedies may be commenced which retard or prevent fermentation changes, and formost amongst these is creasote, which is now easily procured in *soft* gelatin capsules, each containing one minim. Six may be given in the day; 2, one or two hours after each meal.

Carbolic acid, 1 to 3 minims, may be likewise used. Sulphurous acid, in doses of 1 drachm, freely diluted; sulphocarbolates of soda and potash, sulphites of the same bases, or salicylates, in 10 to 20 grain doses, may be given, or oxide or nitrate of silver in doses of $\frac{1}{8}$ grain in pill. Often the writer has obtained benefit from 5 minim doses of oils of cloves and peppermint, which are powerful and harmless antiseptics.

Charcoal freshly dried and given in the dry state, wrapped up in wafer paper, is a powerful absorbent of the gas which accumulates during the acid fermentation, and which adds to the distress of the patient.

Having relieved the more acute stages, the physician should direct attention to the condition of the gastric mucous membrane, which is the source of the trouble. Subcarbonate of bismuth, 10 grains; heavy magnesia, 10 grains; and morphia, $\frac{1}{20}$ grain in powder, will afford the best routine treatment. An excellent combination is:

℞.—Bismuth subnit. gr. xv.
Lactopeptin. gr. xv.
Pulv. ipecac. et opii gr. ij.—M.

S.—Make twenty such powders. One to be taken three times a day.

Or,

℞.—Magnes. carb. pond. gr. x.
Papain (Finkler) gr. ij.
Pulv. opii gr. $\frac{1}{8}$.—M.

S.—Make twenty of such powders. Take one three times a day after meals.

These may be given midway between meals. It is a great mistake in these cases to give opium in such doses as might affect the cerebrum. $\frac{1}{5}$ grain of opium will be found a maximum dose for the purpose—*i.e.*, to act as a local sedative. Often $\frac{1}{12}$ grain will be found sufficient. After a time tonics—the vegetable bitters in combination with mineral acids—may be judiciously administered.

It is of the utmost importance to regulate the diet, and everything found by the patient to increase the acidity should be carefully avoided. Pastry and fermented liquids are especially hurtful. English beer should be forbidden, though Pilsner and lager beer may be freely taken. Wines of all kinds should be used with great caution. Starchy and saccharine foods should be given with care, but meat, fish, and poultry may be allowed. Skimmed milk and kali water, or lime water, may constitute the entire diet till the stomach returns to its normal condition.

ACNE.

The treatment must be constitutional and local. Disorders of digestion, sexual excitement, and menstrual disturbance should be corrected by appropriate remedies. The presence of a large amount of sugar in the diet, and the free use of beer, wines, and all fermented liquors is to be forbidden.

Bismuth, in large doses, is the best of all remedies if there be any gastric irritability; and very full doses of bromides in sexual disturbances.

In most cases it will be advisable to give a series of mild mercurial purges at the beginning of the treatment. These may be occasionally repeated at intervals. One large dose of cod liver oil at bedtime to act as a laxative, especially in thin subjects, is of great value. The best results, in robust patients, are obtained by frequent purgation by any active mineral water or saline cathartic.

Payne speaks highly of the following mixture. It may be given in anæmic cases with much advantage:

℞.—Ferri sulph. gr. xxiv.
Acid. sulph. dil. ℥j.
Magnes. sulph. ℥iv.
Sodii sulph. ℥iv.
Aquæ menthæ pip. ad ℥xij.—M.

S.—Take two tablespoonfuls before meals two or three times a day.

Sulphur and *arsenic* internally—10–20 grains of sulphur mixed with a teaspoonful of Keiller's orange marmalade (precipitated sulphur may be substituted), and the dose administered three times daily produces often good results; $\frac{1}{10}$ grain of sulphide of calcium, in a pill, acts in a similar manner. These remedies are often of very great value in simple acne indurata.

In very chronic cases arsenic may be tried, but this remedy must be continued for a considerable period before good results are obtained. The dose need never exceed three minims of arsenious acid solution, and should be given four times daily along with meals. It is advisable to give arsenic for five or six weeks, and then stop and begin the internal use of sulphur for two or three weeks, and continue thus alternating for several months; or, whilst arsenic is being administered, one nightly large dose of sulphur (1 drachm) may be given. Belladonna, bromide of potassium, ergot, ichthyol, nitrate and oxide of silver, phosphorous and many other drugs are recommended. When they do good it is only because they have probably relieved the affections which are the cause of the disease; they cannot be said to have a specific effect upon the sebaceous glands.

The local treatment of acne might fill a fair-sized volume, each dermatologist advocating special formulæ of his own. Only those advocated by the best of authorities need be mentioned, and the following is, perhaps, the best routine method:

In the milder forms of the disease, the inflamed glands, with their obstructed ducts, should be submitted to smart friction with a rough towel after thorough washing with soap and hot water, or steaming of the face over boiling water. Any of the pimples or comedones which show black points or evidences of pustulation should be pressed, and their contents squeezed out by firm pressure with the fingers; or, better still, by firmly pressing with a watch-key form of instrument devised for the purpose. Good results may sometimes be obtained by mowing down the summits of the comedones with pumice stone, fine sand, or powdered marble, before applying pressure. After this, the following lotion should be freely dabbed over the face and allowed to dry: Precipitated sulphur, 2 drachms; precipitated carbonate of zinc, 40 grains; spirit, 1 ounce; rose water, 9 ounces. The sulphur, according to some observers, acts better if combined with an alkali, and the following combination may be regarded as an exceedingly dilute Vleminckx's solution:

℞.—Sulphur. præcip. ℥ ij.
Zinci. carb. præcip. ℥ ss.
Aquæ rosæ ℥ v.
Liquor calcis. ℥ v.
Eau de Cologne ℥ iij.—M.

S.—Use as directed. Shake well.

This will be found the most satisfactory method of dealing with mild cases of acne of the face, when there is moderate suppuration and little pain and redness. If the acne does not soon yield, a lotion consisting of corrosive sublimate, 12 grains; spirit, 1 ounce; and almond emulsion, 8 ounces, with glycerin, 1 ounce, may be tried. These lotions should be freely applied at least morning and night, and, when possible, once or twice during the day, and allowed to remain on until next application of the soap and friction. Oxide of zinc may be substituted for the carbonate, but the latter is less noticeable, being nearly the color of the skin.

In those cases where lotions are not convenient, the same objects may be secured by rubbing in an ointment like the following:

℞.—Sulphur. præcip. gr. xxx.
Zinci carb. præcip. gr. xxx.
Lanolin. purif. ʒj.
Acid. carbolici ♏. xv.—M.

Or,

℞.—Hydrag. ammon. gr. xxx.
Adip. benzoat. ʒj.—M.

Some cases in the author's hands have yielded to an ointment of hypochlorite of sulphur, 1 drachm, and lard, 1 ounce.

Shoemaker insists upon the puncturing and evacuation of all pustules by incision with a needle-knife instrument in preference to squeezing, and followed afterward by soothing ointments of oleates of lead and bismuth, 2 drachms to 1 ounce.

Where there is much tenderness and redness, with free pustulation, the friction must be dispensed with, and soap used very sparingly. An over-fatted basis soap like "vinolia" may, however, be freely used in all cases of acne. In those case where active inflammatory changes are going on, an astringent lotion of strong solution of subacetate of lead, 4 drachms; spirit, 1½ ounces, and rose water, 10 ounces, may be freely applied after steaming of the face.

Where there is much induration present, steaming and friction should be followed by mild mercurial ointments, such as diluted citrine ointment, or Hebra's solution of green or potash soap in strong spirit, may be rubbed in. The following is the formula for Hebra's soap solution: Green soap, 4 ounces; rectified spirit, 2 ounces; spirit of lavender, 1 drachm. Or a mixture of 4 drachms of liquor potassæ, and 9½ ounces of elder flower water, may be applied.

Hertzmann's method of treating indurated or pustular acne is to apply strong chloride of iron solution to each pustule after evacuating it; to apply frictions to the face of carbolic lotion 3–5 per cent., and afterward the following:

℞.—Acid. salicylic. ʒj.
Spt. vini rect. (95 per cent.) ʒviij.—M.

For the seborrhœic form he advises daily frictions of Vleminckx's solution (described in the article on Scabies.) For the papular form he recommends frictions with a weak Hebra's soap solution, and in very bad cases the following:

℞.—Naphthol. ʒijss.
Sulph. præcip. ʒjss.
Lanolin. ʒij.
Sapo viridis ʒij.—M.

Iodide of sulphur ointment has been used in very chronic cases with benefit. The injection of nitric acid, or nitrate of mercury solution, into the pustules is a plan that few will ever try. It produces pain, often of a very severe kind, and may cause unsightly scars.

Good results may sometimes be produced by touching the summits of the pimples by the plain end of a wooden match dipped in pure carbolic acid, or the strongest liquor ferri chlor, only operating upon a limited number at once; the pustules may thus be caused to wither up and disappear without leaving a scar.

The author has had success, after failure with the above list, by using the following valuable formula of Unna: Benzoated zinc ointment, 10 drachms; rice starch, 5 drachms; pure resorcin, 30 grains; corrosive sublimate, 3 grains. This should be well rubbed in after steaming and washing with vinolia soap three or four times a day. See author's *Materia Medica*, fifth edition, page 94.

Unna also recommends an ointment consisting of lanoline, lard, solution of chloride of calcium, oxygen water, 2½ drachms each, and precipitated sulphur, 1 drachm.

ACNE ROSACEA.

The name acne applied to this affection should not tempt the student to apply the ordinary acne treatment, which is worse than useless. As the disease in its early stages is almost always depending upon an irritable condition of the gastric lining membrane, often associated with distinct evidence of dyspepsia, the physician should vigorously attack this error. If not corrected, the erythematous stage will sooner or later pass into one of persistent dermatitis with pustulation, thickening and hypertrophy, which can only be relieved by the *knife* or *cautery*. The treatment should be directed to the cause of the dyspepsia, and if this can be discovered to be depending upon the ingestion of irritating food, alcoholic beverages, or condiments, such should be at once stopped; irregularities in the time of eating should be avoided, and, of all remedies, *alkalies* are most useful. Bismuth subcarb., 10 grains; magnesia carb., 10 grains; powered opium, $\frac{1}{16}$ grain three times daily.

midway between meals. Or, Gregory's powder, 1 ounce; powdered gentian, 1 ounce; and bicarbonate of soda, 1 ounce; mixed and given in doses of a large teaspoonful in water after meals.

Saline purges following a pill consisting of blue mass, 4 grains; euonymin, 2 grains, every third night, are very useful. Abnormal irritability of the gastric nerve endings, leading to vasomotor disturbances in the circulation of the nose and face, is always present, and the author finds that the following often gives marked relief: Antipyrine, 100 grains; liquid extract of coca, 2 ounces; tincture of orange, 1 ounce; glycerin, 1 ounce; in doses of a teaspoonful between meals.

Two capsules, containing 1 minim of pure creasote each, given before meals often remove the dyspeptic troubles, and diminish the congestion caused by the reflex inhibition of the vasomotor nerves, but upon the whole more satisfactory results will follow the antipyrine and coca treatment after the active dyspepsia has been removed. In women acne rosacea often arises in the disturbance caused by the cessation of the menstrual flow, and here attention should be at once directed to the state of the nervous system and undue reflex excitability combated with full doses of bromide of sodium, with 2 minim doses of arsenious acid solution, or the following:

℞.—Potassii iodidi gr. xl.
Potassii bromidi ℥j.
Liq. acid. arsenios. ʒjss.
Tinct. sumbul ʒij.
Camphoræ aquæ ad ℥xij.—M.

S.—Take a tablespoonful, three times a day, after meals, with water.

Local treatment is of little value. In the early stages some relief may be obtained by alkaline lotions. Bicarbonate of soda, 1 ounce in water 30 ounces, freely applied; or an ointment of 4 drachms of strong solution of subacetate of lead to 2 ounces of lanoline may be applied.

Shoemaker advises an ointment of oleate of bismuth to be applied, and the greased surface powdered over with a mixture of oleate of zinc, subcarbonate of bismuth, and powdered starch. The ointment of hypochlorite of sulphur is recommended, but generally it does harm.

Free scarification by a needle-knife instrument, containing many small blades, drawn across the affected part to cause obliteration of the hypertrophied vessels, has been followed by good results in the hands of some men. Electrolysis carried out by thrusting a fine needle, connected with the negative wire from about 6 Leclanché elements, deep into the tortuous vessels is practised. The continuous or faradic current may be tried, and if there be much hypertrophy, free removal must be carried out by the surgeon either with the knife or galvano-cautery.

ACROMEGALY.

No treatment is of the slightest avail in this rare and interesting deformity. The enormous growth of the hands and face proceeds steadily in the presence of large doses of iodides and the other drugs hitherto tried in vain. Erb, after discussing the pathology of the disease, concludes by stating that alterative drugs would seem to be indicated in the early stages, but that tonic treatment will as often be called for owing to the initial weakness and nervousness, the drugs being selected which seem best to suit the individual case. Ruttle has given great relief to several painful symptoms in a case of this affection by using exalgine.

ACTINOMYCOSIS.

The now demonstrated fact that this disease is conveyed to man from cattle and horses suffering from what is known as "lumpy jaw," at once demonstrates the possibility of preventive treatment. Absolute cleanliness is all that is required. As soon as the disease appears in man, it can only be met by complete removal by surgical methods. Caustics and antiseptics are not to be relied upon. Wherever the characteristic yellow grains, visible to the naked eye, are found, the abscess cavity containing them should be freely incised, and not a trace of the affected tissue left. It should be scraped with a curette or destroyed with the cautery. When the disease attacks the alveolar process of the jaw, this should be removed by the curette, knife, gouge, or saw. When it has crept into the interior of the hollow bones of the face, these should be opened up by the chisel and gouged out, and after the application of a strong caustic, packed firmly with iodoform gauze, and permitted to heal up from the bottom.

The entrance of the fungus through decayed teeth should always be looked for in doubtful cases. The sooner its presence is detected the more efficacious is treatment.

Actinomycosis of the lung has been treated by cutting down and resecting the lung, but little hope is to be expected from such a serious measure.

Keller diagnosed the disease in the brain in a patient who had abscesses over the ribs, which had been opened and scraped. The skull was trephined, pus extracted, immediate improvement followed and lasted for eight months, when the symptoms returned and death followed a second operation.

ADDISON'S DISEASE

gives to the student a striking instance of the uselessness of attempting treatment without some knowledge of the pathology of the disease. All that he can hope to do in the present state of uncertainty about the cause of the affection is to treat symptoms. Anæmia should be

combated by iron and arsenic. Vomiting should be treated with gastric sedatives like bismuth, and loss of appetite with tonics. Fagge suggested iodine both internally and externally. It appears to the author that as in all probability there must be a serious implication of the ganglia and branches of the sympathetic interfering with their inhibitory function, benefit might be obtained by the assiduous application of a strong, constant current to the region of the supra-renal bodies.

In hospital or private practice he has never seen any benefit from any drug which he has used, and chloride of gold, nitrate and oxide of silver, arsenic, antipyrine, and many other substances were prescribed without effect.

Assiduous and even forced feeding seems to check the progress of the disease for a time till the stomach gives up.

ALBUMINURIA.

Since this condition will be found in more than 50 per cent. of the cases to be dependent upon Bright's disease, its treatment will be mentioned under that head. In those cases where albumin appears in the urine, independent of renal disease, it may (speaking generally) be said to be in such small amount as not to call for any special treatment. Where, however, more than a trace is pretty constantly detected, the physician should determine the *cause* and treat it. If, as is common, the albumin appears as the result of defective assimilation of albuminoids, attention should be at once directed to the state of the digestive organs, and especially the liver; and there is no more potent remedy in such cases than a strictly milk diet, with or without pepsin. Home-made koumiss, prepared by mixing ½ pint of water, ½ pint of buttermilk and 4 pints of fresh milk and 1 ounce of loaf-sugar, leaving in a warm place and shaking occasionally for thirty-six hours, will make a palatable draught, very suitable in many cases of disease, especially in Bright's disease. Albuminuria occurring during febrile attacks, zymotic diseases, inflammatory affections, etc., will yield to the remedies suitable for the primary disorder. When depending upon obstruction to the circulation, as in valvular affections or cirrhosis, the albumin will disappear upon the removal of the cause when possible. Cardiac tonics and diuretics, by strengthening the heart muscle and stimulating the renal bloodvessels, may cause its disappearance. The wet pack is very serviceable in such cases.

Arsenic and iron, separately or combined, are of great value in the treatment of chronic albuminuria, especially when the drain of albumin has produced a marked effect upon the blood. Iron affords the best results in albuminuria, depending upon a morbid state of the blood, as in scurvy, pyæmia, and hospital gangrene. The albuminuria of adolescence, or so-called intermittent or functional albuminuria, generally yields readily to rest in bed and a strict milk diet. It is

hardly necessary to remind the student that albuminuria, depending upon discharges finding their way into the urine from the urethra, prostate, bladder, or pelvis of the kidney, can only be treated by surgical methods directed to the diseased conditions in these localities. As a rule, the broad statement may be accepted as true that no drug possesses the specific power of markedly causing diminution in the quantity of albumin appearing in the urine, and it is better for the physician to attack the cause than to lose time in administering the usual list of mineral and vegetable astringents. Moreover, some authorities affirm that their use is positively injurious.

Caffeine, lime-water, copaiba, fuchsin, gallic and tannic acids, glonoine, hydrastis, acetate of lead, ergot, cantharides, alum, chloride of gold, chloral, chloride of sodium, turpentine, and a host of other remedies have each, in somebody's experience, been found to markedly diminish the amount of albumin; but, when tested fairly, have been generally found to fail.

The albuminuria of pregnancy, when slight or transient, does not call for medication; when persisting and copious, it may be safely dealt with as if occurring in Bright's disease, which see.

ALCOHOLISM.

In the acute stage of drunkenness, falling short of alcoholic poisoning, the physician may be called upon to administer a remedy to counteract rapidly the symptoms of alcohol. The solution of acetate of ammonia, in doses of a wineglassful every fifteen minutes, will often causes the uproarious or maudlin stage of drunkenness to give place to a condition of perfect sobriety in a surprisingly short time; 1 drachm of carbonate of ammonia, dissolved in 2 ounces of vinegar, makes an efficient substitute in the absence of the B. P. solution.

The hypodermic injection of $\frac{1}{3}$ to $\frac{1}{2}$ grain of pilocarpine will act with equal magic, and it can be administered when the patient refuses, or even when he is unable, to swallow the bulky, unpleasant solution. Cocaine, kola nut, caffeine, and very strong coffee produce somewhat similar results, but much more slowly and less satisfactorily.

If *coma* has already occurred, the stomach-pump must be used, and cold affusion or galvanism resorted to. (See under Poisoning.)

Acute gastritis following a debauch, and leading to serious vomiting, is best met by a large blister over the stomach, and by the administration of small quantities of ice by the mouth, and morphia hypodermically, or by the following mixture:

℞.—Bismuthi subcarb. ℥ iij.
Acid hydrocyan. dil. ℥ j.
Mucilag. recentis ℥ jss.
Morphiæ hydrochlor. gr. j.
Aquæ camphoræ ad ℥ iv.—M.

S.—Take a teaspoonful every hour; shake well.

If there be no collapse or severe pain, the stomach should be washed out with 40 ounces of water, in which 5 to 10 minims of creasote have been dissolved. In the chronic vomiting creasote capsules, $\frac{1}{16}$ grain of morphia in minute pill, or minim doses of arsenious acid solution, or 10 grains of bismuth and 5 grains of heavy magnesia may be given. The writer has often seen vomiting stop after 5 to 10 minim doses of tincture of capsicum, which had been given to allay the craving. By far the best food at this stage is good buttermilk turned acid, and if very acid it can be freely given with kali water, and this combination may stop vomiting which has resisted all treatment. The fluid known in Ireland as buttermilk differs widely from the vile compound known by the same name in most parts of England.

The chronic dyspepsia of drunkards is a troublesome affection in which drugs are of little value. The great difficulty experienced by the physician is to select some form of liquid nourishment which can be taken copiously by the patient at short intervals, which will be easily digested and acceptable to the vitiated palate. There is nothing better than the buttermilk just mentioned, which may be given in unlimited amount. It may be administered every fifteen or thirty minutes, either alone or mixed in equal quantity with fresh milk, soda, or kali water. The formula mentioned upon page 23 for preparing artificial koumiss will be found a palatable and nutritious liquid. Where buttermilk is not obtainable the koumiss prepared with yeast and cow's milk may be employed. (See fifth edition of author's *Materia Medica*, page 578). Carefully prepared beef-tea and chicken soup, either of which can be thickened with barley water, and fortified with Liebig's extract of meat, or ordinary clear or thick soup of any kind that the patient may fancy can be freely given. If there be great weakness or prostration, and the stomach refuses to accept any nourishment, except in very small quantity, Valentine's beef juice in drachm doses every half hour, or Brand's beef jelly with ice every hour, affords the best chance of tiking over the difficulty. Associated with the gastric symptoms is the intense craving for alcohol in some form. This should be stoutly withheld. The physician generally sees the patient after he has been indulging freely for a considerable period, and alarm has been excited by the depression produced by continuous vomiting or by the dread of delirium tremens. The serious difficulty which at once confronts the attendant is the responsibility of cutting off the stimulant. There is a deeply rooted prejudice against this line of action held both by the unfortunate victim and his friends, and if such a step be taken, any mishap occurring is sure to be attributed to this point in the treatment.

In the vast majority of cases this is the correct course to pursue. The experience of gaol surgeons proves how constantly immediate improvement sets in, and how exceedingly rarely does any mischief follow the abrupt withdrawal of stimulants, even in the broken down patients

committed to prison for some act perpetrated during their prolonged debauch.

This prejudice has, to a large extent, arisen from the aversion to alcohol often noticed in patients just before symptoms of delirium tremens set in at the end of a drinking bout. The supervention of the delirium is attributed to the cessation of stimulation, whilst in reality, it is but a symptom of the disease. The prejudice is also traceable to the memory of the horror and depression caused by the cutting off of the stimulant in former attacks, and the patient is generally loud in his protestations that death will follow the sudden withdrawal of his liquor.

Though the physician should act firmly in insisting upon this complete withdrawal, he will be wise to postpone it for a short time if he has good reason to suspect that symptoms of delirium tremens are about to immediately declare themselves.

Exception should be made in those very much debilitated from disease, especially in those suffering from heart affections, and in the aged. If the pulse should exhibit marked signs of weakness and irregularity; if there has been prolonged insomnia; or if the history of the patient shows clearly that he has for years been taking alcohol in moderate doses daily before his recent excess, then small regulated doses of alcohol should be administed to him at stated intervals, the dose to be proportional to his habits. Generally speaking, 12 ounces of whiskey should be rarely permitted during the twenty-four hours, and 6 ounces for all cases may be said to be a fair allowance during the first few days, though the patient may have been in the habit of taking much larger quantities.

If there is much gastric irritability champagne may be given, but all other wines should be forbidden. Good whiskey alone being selected as the stimulant, the rule should be laid down that it must be taken by the patient mixed with his soup or milk by a reliable nurse.

In the great majority of instances, the physician when called to treat a case of chronic alcoholic poisoning will be safe in fearlessly acting as he would in any other case of poisoning—by immediately preventing the administration of the poison. Much can then be done with the assistance of a firm nurse, who should administer liquid nourishment every fifteen or thirty minutes.

The following may be given with benefit to allay the craving for alcohol, and to some extent take its place:

℞.—Spt. ammon. aromat. ℥ij.
Tinct. cinchonæ ℥ijss.
Tinct. capsici ℥iij.—M.

S.—A large teaspoonful in half a tumblerful of effervescing potash water every hour.

Or the following may be tried:

℞.—Ext. cocæ fld. ℥ij.
Tinct. card. comp. ℥ij.
Tinct. cinnamom. ℥j.—M.

S.—Take a teaspoonful every hour with water.

Or the following:

℞.—Tinct. jaborandi (1 in 4) ℥v.
Tinct. chiratæ ℥ij.
Aquæ ad ℥xx.—M.

S.—Take a dessertspoonful every fifteen minutes.

Attention has recently been directed to the value of strychnine and nux vomica in the treatment of alcoholism and delirium tremens. The author first pointed out in 1882 the striking effects of alcohol in strychnine poisoning, and published a case where recovery followed after the failure of the recognized remedies. He is satisfied that in strychnine we have a remedy of great value to act as an antagonist to alcohol, and he finds that the following will produce good results in diminishing the craving for alcohol and preventing the depression following its withdrawal:

℞.—Tinct. nuc. vomicæ ℥ij.
Aquæ camphoræ ℥xij.—M.

S.—Take a tablespoonful every hour.

Coca leaves and quassia chips may be chewed during the intervals between food and medicine.

After the relief of the more acute symptoms, tonics, as quinine with a mineral acid, and gentian and calumba, may be given. If the gastric symptoms continue after the disappearance of the craving, bismuth or oxide of zinc, with a minute dose of morphine, $\frac{1}{20}$ grain, may be given; or potas. bicarb., 1 ounce; acid. hydrocyan. dil. 1 drachm; aquæ to 12 ounces—a tablespoonful, with an equal quantity of fresh lemon-juice, every two hours.

For the persistent loss of appetite and want of energy, associated with restlessness and disturbed sleep, sometimes with traces of hallucinations following long after prolonged alcoholic excess, there is no better remedy than the following:

℞.—Quininæ sulphatis gr. xxv.
Acid. nitrohyd. dil. ℥vj.
Ext. cinchonæ liq. ℥iij.
Aquæ destillatæ ad ℥x.—M.

S.—Take a tablespoonful three times a day with water before meals.

For the insomnia of chronic alcoholism, opium should be sparingly employed. 1 grain of the watery extract at bedtime may be given occasionally, but bromides may be freely and continuously employed, and 10 to 30 grains may be given in conjunction with any of the above combinations. It is a good plan to give the bromide of potassium in doses, say of 20 grains every three or four hours, alternating with the sal volatile and capsicum mixture. Chloral should never be trusted, owing to its dangerous depressing action upon the heart. (For the treatment of insomnia in delirium tremens see under Delirium Tremens and Insomnia.) Long after alcoholic excess has terminated in the condition requiring the treatment mentioned in the previous pages, the patient should be seriously cautioned, and, if necessary, placed under mild restraint, and if the craving continues, and the will be unable to resist it, restraint should be insisted upon, and a residence in a good inebriate asylum be strongly advised for as long a period as possible.

The treatment of the various diseases and conditions following upon chronic alcoholism may be found under Cirrhosis, Delirium Tremens, etc.

AMAUROSIS.

Accepting this term as only including those cases of *total blindness*, associated with atrophy of the optic nerve without any evidence of disease or change in the media or coverings of the globe, it will be apparent that but little can be achieved by treatment. A condition depending upon so many widely different causes, all tending to eventuate in a complete white atrophy of the disc, will require very careful discrimination as to the diagnosis of the extract factor at work in each case. If complete white atrophy has not already occurred, sometimes the physician can do a great deal.

If those cases of amaurosis following diphtheria and scarlatina, if the case is recent, strychnine should be freely given, and as a rule its administration by the mouth should not be attempted, but at once the hypodermic injection of $\frac{1}{25}$ to $\frac{1}{12}$ of a grain daily should be persevered with for some weeks. There is some hope that this measure may be of use even in traumatic cases, and good results are obtained in amaurosis after lead, tobacco, and alcoholic poisoning, where already the case has passed out of the category of amblyopia. The strychnine treatment may be supplemented by a cautious use of the constant current, not more than 4 Leclanche cells being used, and it is a good rule to begin with 2, one pole being placed at the occiput and the other over the eyebrows. If there be evidence of syphilis as a cause, rapid mecurialization or large doses of iodide of potassium may be tried, though it is doubtful if ever success has followed such treatment.

In those rare cases where amaurosis has rapidly supervened upon the sudden suppression of some long standing discharge, as at the cli-

macteric period and after the removal of bleeding tumors, some hope may lie in free purgation, and the introduction of a seton or blister over the brow. The administration of arsenic (5 minims of Fowler's solution) may be continued at the same time that the hypodermic injections of strychnine are being given. Chloride of gold and sodium (U.S.P.) in pills containing $\frac{1}{20}$ grain may be given four times a day, and in a few cases good results have been recorded.

Pilocarpine, $\frac{1}{3}$ grain hypodermically, has, in a few cases, been followed by benefit, and the same may be said of inhalations of nitrite of amyl and large doses of santonin at bedtime.

AMBLYOPIA.

Many cases of dimness of vision or defective sight, without marked visible changes in any part of the eye, have been proved to be caused by tobacco, alcohol, or lead poisoning, and a few have been known to owe their origin to the continued administration of large doses of quinine; sometimes malarial poisoning has been the cause.

For tobacco amblyopia, or tobacco amaurosis, as it is more commonly called (though the latter term should be confined to those cases where there is total blindness, which is rare), the first thing to do in the way of treatment is to stop immediately and completely all use of tobacco. In the case of young smokers this will often effect a speedy cure, but in those where the habit has been long established, and especially where there are found some evidences of disc atrophy, the affection may prove very difficult to deal with, and even in spite of treatment may, in rare instances, pass into permanent amaurosis. In addition to abstinence from tobacco and alcohol, everything that improves the general health and tone should be advocated. General tonics, especially strychnine, in mild cases, and in severe ones the hypodermic injection of $\frac{1}{16}$ grain of this drug under the skin in the region of the temple daily. Sulphate of zinc in 5 grain doses may be given internally after each meal whilst the strychnine treatment is being carried out. Teaspoonful doses of Easton's syrup may be commenced when tne hypodermics are stopped, which should be soon after decided improvement sets in.

A careful administration of the induced current is always advantageous. When quinine is given it should be in doses not exceeding 1 to 2 grains, and if the constitutional effects should by chance appear, owing to idiosyncrasy, the drug must be discontinued.

Pilocarpine subcutaneously has given good results in many cases; it may be occasionally administered during a course of strychnine. Nitrites have been recommended, but their effects are too transient to be of any permanent value.

Amblyopia, caused by chronic alcoholism, will require to be dealt with upon the same lines—the total abstinence from alcohol in every form being rigidly insisted upon. Everything that can improve the

general health, as changes of food, air, and scene, sea bathing, and rest to the eyes are to be recommended, and the judicious administration of tonics, chief among which is strychnine, or the employment of hypodermic injections of this drug in severe cases. The writer believes that, where the affection is of long standing, the best treatment is to persist in the internal administration of $\frac{1}{15}$ grain of the chloride of gold and sodium in pill, after a few weeks treatment by strychnine, with occasional hypodermics of $\frac{1}{4}$ grain pilocarpine.

Often alcoholic and tobacco habits exist in the same person, and of course, where amblyopia supervenes, both habits must be stopped entirely. Quinine amblyopia may be treated in a similar way, though the above remedies are seldom required as the affection of sight rapidly disappears after discontinuing the use of the drug.

Amblyopia caused by lead poisoning will require for its treatment similar measures directed to the improvent of the general health. Iodides of sodium and potassium, in full doses largely diluted, afford the best treatment; they may be advantageously combined with sulphate of magnesia. It is a good plan to cause gentle purgation with the sulphate of magnesia in lemonade made with dilute sulphuric acid, while the iodide treatment is kept up constantly.

Sulphurous baths are also of great use. It is needless to say that every caution must be employed against the further introduction of the poison into the system, by great personal cleanliness, etc. The constant current is often of much benefit. The state of the kidneys will require attention, and, if albuminuria be present, the possibility of uræmia must be remembered and appropriate treatment at once resorted to, with the view of causing elimination of the urea and other compounds by the skin and bowels. (See under Plumbism.)

Amblyopia coming on during pregnancy must be carefully watched, and if the ordinary treatment by purgation and hot packs does not afford relief, as in the case of acute Bright's disease, and should the amblyopia be passing into amaurosis, at once premature labor should be induced, and free purgation kept up afterward until all visual troubles pass off, and the swollen and congested disc assumes its normal appearance. (See under Bright's Disease.)

ALOPECIA—See Baldness.

AMENORRHŒA.

Depends upon so many different causes that a *resumé* of its treatment will necessarily embrace an extensive list of drugs of widely differing actions.

Emmenagogues may be regarded as remedies which, either by *direct* or *indirect* means promote the menstrual flow. The flow may be diminished or absent through purely constitutional conditions, as plethora or anæmia, in which cases the treatment will differ widely—

the *indirect* emmenagogue action of cathartics being indicated in the case of plethora and the free administration of ferruginous compounds, which act as indirect emmenagogues, in the case of anæmia. While, again the flow may be absent or diminished through purely local causes, when the action of a *direct* emmenagogue like ergot will be indicated. The action of these so-called direct emmenagogues is little understood, and a host of remedies are in use about whose *modus operandi* we know nothing beyond the fact that, in some cases after their administration, the retarded, diminished, or absent flux returns in natural amount. That these so-called direct emmenagogues have any direct stimulating effect upon the lining membrane of the uterus is exceedingly doubtful. It is, however, certain that most of them, when given in large doses, acts as ecbolics, and cause the expulsion of the uterine contents by powerful stimulation of the muscular fibres of the organ.

In those cases where the menstrual flow has *never* appeared, the cause may be found in some *malformation* or in *absence* of development of the sexual organs. If the latter, the case hardly can be hoped to come into the sphere of treatment, while, if menstrual discharge has been poured out into the vagina or interior of the uterus and retained because of an imperforate hymen, or atresia, or occlusion of the cervix, os, or vagina, the case falls under the care of the surgeon. In atresia, where owing to absence of a considerable portion of the lower part of the vaginal canal there is no hope of tunnelling out a new passage, it is better to tap the distended sac per rectum, and leave a free opening for the accumulated flow and a constant exit for future discharge of the anus.

Where the occlusion is low down, and there is but a thin layer of tissue closing the perineum, the treatment will be the same as if an imperforate hymen was the cause of the retention, *i. e* , a free crucial incision. The tarry fluid should be allowed to flow spontaneously, and no pressure should be employed, but gently syringing with a weak solution of bichloride of mercury (1 : 5000) will be advisable.

If the case be one of merely delayed appearance of the first flow, the patient being neither malformed nor showing evidence of absence of uterus or ovaries, the physician should hesitate before yielding to the anxious solicitations of friends to begin active treatment by powerful emmenagogue remedies, always remembering that the menstruation may be delayed long beyond the average age without any harm whatever to the patient. It is, moreover, especially necessary to abstain from such treatment where there is evidence that the general growth and development of the body is below the ordinary standard for the age of the patient; or where the amenorrhœa is depending upon phthisis or Bright's disease. If the patient appears in every other respect in perfect health, it would be wiser for the physician to refrain from the use of drugs entirely, and recommend change of air and scene, and active outdoor exercise.

Should, however, anæmia or plethora or any other diseased condition, or any departure from health be noticeable, it should be at once attended to, after which the physician may wait before employing any remedy intended to act as a direct stimulant to the uterus until there is some indication of an attempt upon the part of nature to establish the menstrual flow. This may be recognized by some of the usual symptoms preceding menstruation, such as headache and flushing of the face, with bleeding from the nose, sense of fulness in the breasts, backache, and general malaise coming on periodically. These symptoms cannot long continue in the absence of the menstrual discharge without risk to the patient's health.

The hot hip or sitz bath (about 103° F.) should be resorted to, the patient put to bed and covered with warm clothing. Often a good hot foot-bath in mustard and water along with hot fomentations to the loins answers well, or a large hot linseed meal poultice, with mustard, applied to the lumbar region for a few hours every evening may establish the flow. It is an excellent plan to give a local hot mustard pack by wringing a small blanket out of hot water and mustard, and enveloping in it the lower half of the body and legs, and putting the patient to bed. This treatment may be continued once a day for three or four days at a time, and it will be well to supplement it by giving about 1 ounce of gin or whiskey with a teaspoonful of tincture of saffron, or 10 minims of oil of pennyroyal or peppermint, with hot water. Rue and savine are drugs of great power and should seldom be given. The oil of parsley, in capsules containing 5 minims, is not open to the objection of causing irrigation like rue and savin.

Pilocarpine given hypodermically in doses of about $\frac{1}{6}$ grain, while the patient is in the pack, will be found, in the writer's opinion, to be the most effectual remedy for causing the menstrual discharge to appear.

If the molimen is ushered in with hot skin and fever, small doses of aconite or cimicifuga given every hour ($\frac{1}{2}$ minim of tincture of aconite or 3 minims of tincture of cimicifuga) will afford relief. Cantharides has been employed, but its administration is followed by danger.

In those cases where the *symptoms* of menstruation are absent or only vaguely marked—in other words, where there is no indication of a molimen, and menstruation is delayed for a long period after its first appearance is naturally expected, unless the patient is really plethoric, it will be a wise routine practice to saturate the system with iron. The number of preparations at the hands of the physician for this purpose is almost endless, but the best is the pill made of the sulphate of iron and carbonate of potash, and extensively known as Blaud's pill, of which 2 or 3 should be given three or four times a day, after meals. Next in value is the preparation known as dialyzed iron, of which 30 minims may be given four times a day. Griffith's mixture, or a combination of 15 minims of the tincture of iron, and 2 minims

of Fowler's solution, is often of great value; as is also Basham's mixture.

If constipation be present, the decoction of aloes may be given with an iron preparation, or the pill of aloes and iron or aloes and myrrh may be employed, to which asafœtida may be added with advantage. The practice of giving strong purgatives, like colocynth and gamboge, is to be discountenanced.

Even in the presence of distinct plethora, a mixture containing 3 grains of sulphate of iron and 2 drachms of sulphate of magnesia in each dose, given every four or six hours, often establishes the appearance of the flow, the first discharge appearing after free purgation.

In the class of cases just considered, *i. e.*, where menstruation has never appeared, and where no molimen is evident, and where the patient's health is apparently good, and there is no dwarfing of body or malformation of sexual organs, there is no remedy to be compared with the constant current. Beginning with ten Leclanche cells with the negative pole on the sacrum, and a large, flat positive electrode upon the front of the abdomen taking in both ovarian regions, the current may be increased to thirty cells ultimately, though twenty will be found enough for ordinary purposes when administered for fifteen minutes daily. The portable constant current batteries are a source of bitter disappointment and annoyance, and the writer advises every physician to have a battery of large Leclanche cells permanently fixed up in his study, or in any convenient place from which wires can be easily brought to a switch-board upon his writing table. The quart size (new agglomorate pattern), made by the Silvertown Electric Appliance Co., is by far the cheapest and best. In it the porous pot is dispensed with, and its slow and continuous action lasts for two or three years or more, and it can be always relied upon when required, and easily recharged at trivial cost by any handy servant.

The faradic current is also valuable, one pole being placed over the sacrum, and the other alternately over each ovarian region. It will seldom be found necessary to introduce a rheophore up to the cervix or fundus, as in Apostoli's treatment, nor will it be found advisable to ntroduce a galvanic stem intra-uterine pessary.

In amenorrhœa occurring in patients in whom the menstrual flow had been established for a considerable period, the same general principles of treatment may be kept in mind. It will be the duty of the physician to most carefully look into the cause of the suppression, and find out the error in health which is at work in suppressing or diminishing the flow, always keeping before his mind the possibility of pregnancy as a cause.

In the majority of cases a certain amount of anæmia or chlorosis is present, and iron will be our sovereign remedy. Its best and most constant effects are seen in those bloodless patients where the flow, though never for long absent, is nevertheless reduced to a mere trace each monthly illness. 6 or 8, or even 12, of Blaud's pills in the

twenty-four hours, will often effect a cure both of the anæmia and of the obstinate constipation associated with it. The following is a useful combination:

℞.—Liq. ferri dialys. ℥ij.
Glycerin. purif. ℥jss.
Ext. cascaræ liq. ℥iv.—M.

S.—Take a teaspoonful, with water, three times a day, after meals.

Or 10 grains of the ammonio-citrate of iron in 4 drachms of cinnamon water. It is always well before beginning a course of iron, to order a few morning purges of Rochelle salt, 6 drachms; or Epsom salt, 3 drachms.

If there be much loss of appetite, with headache and furred tongue, a plain bitter with an acid should first be given, as:

℞.—Acid. nitrohyd. dil. ℥iv.
Tinct. nuc. vom. ℥ij.
Inf. gentianæ ℥vij.—M.

S.—Take a tablespoonful, with water, three times a day, before meals.

The diet should be carefully looked into, and only the plainest food permitted, and, as a rule, stimulants prohibited. The clothing should be warm, and woolen stockings, with thick soled boots, should be worn, and active outdoor exercise must be insisted upon.

If in spite of such general treatment the menstrual discharge fails to appear at the proper time, the treatment by hot baths and mustard packs is to be commenced at about the time when the absent or habitually scanty flow is expected, and failing the success of these remedies, the so-called emmenagogue drugs are indicated.

Speaking of cases of amenorrhœa with mental depression and from mental shock, G. E. Herman points out that there is no treatment from which the reëstablishment of menstruation can be predicted. Change, fresh air, exercise, food, and tonics are the great therapeutic agents. Of these, change is the essential.

The following drugs are in rupute as emmenagogues:

Ergot will be found a most disappointing drug generally, but success sometimes follows after a few weeks' trial of a pill, three times a day, consisting of 1 grain of ergotine (Bonjean's), 3 grains of ferri reduct., 1 grain of aloes socot. Perhaps the best way to try the value of ergot is to give two or three *large* doses, and if no results follow it may be given up.

Rue or Savine in 3 minim doses of the essential oils two or three times a day about the expected period have been recommended; they sometimes cause great irritation and pelvic disturbances.

Santonin in doses of 5 to 10 grains given at bed-time for two or three nights has been highly recommended. It often fails, and it should be remembered that it is a dangerous weapon; death sometimes

following full doses of the drug. It is safer when given along with castor oil.

Quinine in 10 to 15 grain doses may be tried for a few nights. Any benefit to be expected from it will probably appear after one or two doses.

Hellebore has been given in large doses, but it is not to be recommended. In cases where the flow has been suddenly suppressed small doses of the tincture of green hellebore, 1 minim every hour, will act sometimes after six or eight doses in strong plethoric subjects.

Aconite Tincture employed in the same way, also gives good results occasionally, and the tincture of cimicifuga in 4 minim doses may be similarly used.

Apiol in capsules, containing 3 to 5 minims, is often serviceable, and is not likely to do any harm.

Permanganate of Potassium.—Much has been written in praise of this remedy, and although very strong statements have been made about its constancy and value it will be found to very often fail utterly. Ringer and Murrell extol it in both anæmic and plethoric cases where the flux is delayed or scanty, or suddenly suppressed. 1 to 2 grains should be given in a pill thrice daily till catemenia appear, when its administration should be discontinued till within four days of the next expected period.

Peroxide of Manganese in similar doses appears occasionally to hit. The lactate also, in 2 grain doses, is sometimes successful, as are other manganese salts.

Cantharides is a powerful emmenagogue, and though its dangerous and painful effects upon the bladder and kidneys are constantly known to follow even moderate doses, it still is used occasionally as a remedy to promote the menstrual flow. The dose should commence with ¼ of a minim of the tincture in well diluted mixture three times a day, and be increased to 2 or three minims cautiously. The writer has, however, never used it, and probably never shall use it for this purpose.

Pennyroyal (mentha pulegium) is a favorite domestic emmenagogue which, in doses of 10 to 15 minims of the essential oil, often acts as a diffusible stimulant possessing some power as a special stimulant to the uterus and ovaries, and it is safe and agreeable when dropped upon sugar or given in weak hot punch at the time of the expected flow. It may be combined to advantage with other drugs of the same class, and may be given internally just before injecting pilocarpine.

Guaiacum is a valuable emmenagogue in young women where the menstrual discharge fails to return after rheumatism or rheumatic fever. 10 grains may be given in fine powder mixed with marmalade or in sherry. The ammoniated tincture may be given with the tincture of aloes in 20 minim doses.

Iodide of Potassium in full doses, 10 to 25 grains, occasionally succeeds in restoring the catamenia when other remedies have been given up.

Jaborandi is a remedy which the writer has observed to cause hemorrhage from the uterus when given hypodermically (as ¼ of a grain of pilocarpine) for other affections, and good results follow this treatment in amenorrhœa where the flow stops without apparent cause. Benefit may probably be obtained from the internal use of the tincture of jaborandi in similar cases, but certainly the best results are to be expected from the full hypodermic dose (¼ to ½ of a grain) of the alkaloid. The dangerous depression which sometimes follows large doses appears, in the writer's experience, to be reduced to a minimum if given when the patient is in a hot sitz bath or local mustard pack.

Electricity, though somewhat uncertain in its action, is a valuable emmenagogue in cases where the menstrual flow has suddenly stopped or failed to appear. It is used in these cases in the same way as in those where menstruation has never been established. The judicious application of the continuous current may be tried alone or in conjunction with any of the treatments already mentioned.

Faradism may be also tried before giving up electricity, when the continuous current fails.

Massage will be found a valuable accessory to the ordinary emmenagogue remedies. The practice of uterine massage, as carried out by some operator is not here meant. This is a very questionable proceeding in most cases, and would seem to be seldom or ever justifiable as a remedy in simple amenorrhœa. Massage of the abdominal walls alone, or in conjunction with electricity or any other treatment, is clearly a legitimate practice.

Pulsatilla, Aletris Farinosa, Bogbean (menyanthes trifol.), Sanguinaria, Hydropiper, Cypripedium, Caulophyllin, and a host of American vegetable drugs are loudly praised by those who, having given them in amenorrhœa and observed the flow to return, have been satisfied about their value.

AMYLOID DISEASE—See Liver, Diseases of, and Bright's Disease.

ANÆMIA.

Like amenorrhœa just considered, this condition is but a symptom of many different diseases, and its treatment will necessarily imply a knowledge of the treatment of various diseases like albuminuria, syphilis, leucorrhœa, plumbism, hemorrhoids, malaria, epistaxis, phthisis, gastritis, etc.

The first object should be to stop the drain upon the system, whether this drain be blood lost by hemorrhage of any kind or by excessive discharge of albuminous secretions; afterward the application of the ordinary laws of health—good, easily assimilated food, open-air exercise, etc.—will be all that is required.

In acute anæmia, where the patient is sinking from the loss of large quantities of blood, the operation of transfusion may be impera-

tive. This may be done in various ways. It is essential to avoid the injection of the blood animals into human veins, and to *always* use healthy human blood. There is a strong feeling growing up against the transfusion of even human blood. When possible the human blood should be defibrinated by collecting in a glass vessel as it flows from the basilic or great saphenous vein, and, after whipping with a glass rod till the fibrin has entirely been removed, it may be injected through a warmed syringe into either an artery or vein. The best artery is the radial, and the nozzle of the syringe may be inserted into the opening in the vessel either in the direction of the hand or toward the heart.

If a vein be selected—the basilic being preferable—the blood should be injected in the direction of the venous stream, *i. e.*, toward the heart.

If time does not admit of defibrinated blood being used, the transfusion must take place direct, notwithstanding the risk of embolism. A suitable transfusion apparatus can be easily made out of Dieulafoy's aspirator, by having a duplicate of the fittings and rubber tube which is to bear the needle at one end and be attached to the end of the cylinder at the other. So equipped the aspirator will bear, attached to each projection at the end of the cylinder, an India-rubber tube with a suitable mounting at its extremity for the insertion of any of the hollow needles or canulæ. Such an apparatus is always at hand, and the modification in no way interferes with its action as an aspirator and it is always ready at a second's notice, whilst the various forms of transfusion apparatus being so seldom used are sure to be out of order when required.

One needle being inserted into the basilic vein of the patient, the other is inserted into the basilic of the donor. It is certainly desirable that the aspirator and tubes and needles be filled with warm, normal saline solution (0.6 per cent. chloride of sodium) before the introduction of the needles. This will diminish the risk of coagulation of blood about the joints of the instrument, and it will be injected at the first stroke into the patient's circulation.

By keeping the needles or canulæ in situation and manipulating the stop-cocks, the blood flows from the arm of the donor into the aspirator, from which it is gently sent by the piston (on the reversal of the cock) into the veins of the patient. From 5 to 20 ounces may be injected at once.

It may be possible to successfully transfuse blood from one patient to another by simply using a flexible bent tube with suitable ends, through which the blood will be driven by the force of the donor's heart. The greatest possible care should be taken to prevent the entrance of air during the operation of transfusion.

In many cases the direct injection of normal saline solution (0.6 per cent. NaCl), in quantities of 20 to 30 ounces, will save life, and, in the hands of Hunter, W. H. Brown, of Leeds, and others, has been more satisfactory than the transfusion of human blood, which will become less and less practised.

Recently Hunter has shown that, for all practical purposes, all the advantages to be gained by transfusion may be equally well and more readily obtained by injection of a neutral saline—as one drachm of common salt to one pint of water. He states that under no circumstances are transfusions of milk or other nutritive fluids to be permitted. He also strongly points out the great danger of transfusing even defibrinated blood.

A glass canula and three feet of tubing and a small funnel is all that is needed.

Blood or saline solution may be injected into the periteneal cavity in desperate cases of acute anæmia, and striking effects have been obtained by the subcutaneous injection of saline solutions (2 to 3 grains to 1 ounce).

A splendid method is that, recently revived by Antiq, of injecting 5 ounces of warm defibrinated blood of the ox into the rectum morning and evening. Half this amount, *viz.*, a wineglassful, may be used at first, mixed with 10 minims of laudanum, till the rectum becomes tolerant.

In ordinary cases of chronic anæmia after attention has been paid to any habitual hemorrhage or discharge, and where the appetite is fair, the physician should attempt to assist nature in restoring the blood to its normal state by the administration of iron in some form. After a smart saline purge, treatment may be commenced, but if the tongue be coated and appetite bad it will be necessary to follow the the action of the purge with a tonic. Either of the following will be valuable:

℞.—Sodii bicarb. ℥iv.
Tinct. chiratæ ℥j.
Inf. gentianæ ad ℥x.—M.

S.—Take a tablespoonful three times a day, after meals.

Or,

℞.—Acid. nitro-hydrochlor. dil. ℥j.
Quininæ sulph. gr. xlv.
Tinct. aurantii ℥j.
Aquæ ad ℥iv.—M.

S.—Take a teaspoonful with a wineglassful of water three or four times a day, before meals.

Sometimes it will be found advantageous to combine the iron with a bitter tonic, as in the following:

℞.—Tinct. ferri chlor. ℥iv.
Quininæ sulph. gr. xl.
Glycerin. purif. ℥j.
Aquæ ad ℥iv.—M.

S.—Take a teaspoonful with water three times a day, after meals.

It is hardly necessary to remind the student that iron preparations should always be given after meals, and diluted.

The citrate of iron with quinine may be given in 5-grain doses, in solution with a little glycerin or syrup and water. The following is a good combination:

R.—Ferri et quininæ cit.		℥jss.
Tinct. nuc. vom.		℥ij.
Glycerin. purif.		℥j.
Infus. calumbæ	 ad	℥viij.—M.

S.—A tablespoonful three times a day, after meals.

Should the anæmia be associated with neuralgia or nerve troubles, a teaspoonful of any of the following syrups may be ordered in a wineglassful of water after meals: syr. ferri phosph., quininæ et strych., syr. hypophosph. comp. (Fellows), syr. ferri phosph. (B. P.). For children there is no preparation equal to teaspoonful doses of syr. ferri phosph. co. (Parrish). Where struma is present, the syr. ferri iod. or pil. ferri iod. (Blanchard) is indicated.

Constipation being present, 5 grains of the pil. aloes et ferri, morning and night, may be given.

Should the anæmia be associated with chlorosis or amenorrhœa, any of the formulæ mention under Chlorosis or Amenorrhœa may be given.

In simple anæmia, where the physician wishes to or a preparation of iron as a blood restorative, without running the risk of upsetting any of the organs or functions of the body, there are not any preparations as pure chalybeates superior to the liquor ferri dialysatus, or to Blaud's pills, or to the ferrum redactum.

Trousseau always insisted upon the superiority of iron filings over all other iron preparations, and recently Peter has insisted upon their great value when given as a powder mixed with chalk, coffee, and rhubarb.

The best results are obtained by giving large doses, and often success follows doses much too large to be assimilated in the body after small doses had been fruitlessly administered for a long time. (See page 424 of the fifth edition of the author's work on *Pharmacy, Materia Medica, and Therapeutics.*) The least bulky preparation of iron is the ferrum redactum, and for children the saccharated carbonate is a pleasant drug. The former drug may be given in doses of 7 or 8 grains in a moderately sized pill.

Much benefit may be obtained by combining arsenic with iron in the treatment of anæmia, and this is best done by giving the arseniate in combination with reduced iron in a pill, or, better still, by the following:

℞.—Tinct. ferri chlor. ℥iv.
Liq. Fowleri ℥j.
Glycerin. purif. ℥j.
Aquæ ad ℥iv.—M.

S.—Take a teaspoonful in a wineglassful of water three times a day, after meals.

Where the palate objects to any of the above preparations, a very elegant combination is the citrate of iron and ammonia, given in effervescence with citric acid.

℞.—Ferri et ammon. cit. ℥ij.
Acid. citric. ℥iij.
Aquæ ℥viij.—M.

S.—Take a tablespoonful with a tablespoonful of the alkaline mixture three times a day, after meals.

The alkaline mixture contains potassii bicarb. ℥vj, aquæ ℥viij.

Teaspoonful doses of the vinum ferri citratis may be given to anæmic patients with very feeble digestion. In treating anæmia when feverishness is present—a very common occurrence after pulmonary or other hemorrhage—Basham's mixture (U. S. P.) or the following is very suitable:

℞.—Tinct. ferri chlor. ℥iv.
Aquæ ammon. acet. ℥iij.
Aquæ camphoræ ad ℥xij.—M.

S.—Take a tablespoonful four times a day, after meals.

If headache follows the administration of iron, saline purgatives may enable the physician to continue its use, and he may give 5 grains of the sulphate with 30 grains of sulphate of magnesia in aerated water with advantage.

The treatment of anæmia should not, however, be confined to the official preparations of iron if these do not prove soon satisfactory. The natural iron waters of Buxton, Kissingen, Altwasser, Berka, etc., may be tried with advantage, and various organic salts of iron, as the albuminates of iron, are believed to be more valuable than those in combination with the mineral or vegetable acids. The citro-phosphate and the sesquibromide and the phosphated pepsin have become fashionable. Cod-liver oil, lactophosphates, malt extract, sea bathing, bracing air, and sometimes a short sea voyage and rest from mental work, often work wonders. Massage is also a powerful remedy in improving nutrition and influencing metabolism, and water charged with oxygen gas has found favor with some practitioners. Manganese salts have been extolled as remedies for anæmia; their utility is very doubtful. Inhalations of oxygen are preferred to oxygenated water by some authorities.

The treatment of pernicious anæmia with iron is generally most

unsatisfactory, and the only medicine of any value is arsenic, which should be freely given in doses beginning with 3 and ending with 15 minims of the liquor, diluted and given after meals three or four times a day. Where arsenic has failed, sometimes phosphorus in doses of $\frac{1}{32}$ to $\frac{1}{16}$ of a grain has given good results. Meyer has recently reported a very striking success from washing out the stomach only once. All the accessory treatment, as Valentine's beef juice, pepsin, malt extract, massage, electricity, oxygen, etc., may be tried.

Lately W. Hunter has made some exhaustive observations upon a case of this disease, believing that the condition is the result of a poison (a ptomaine) produced by organisms of a specific nature within the gastro-intestinal canal. He recommends the use of antiseptic remedies, and selects beta-naphthol as the least soluble and one of the best germ destroyers. This is given in doses of 5 grains thrice daily, suspended in mucilage. He has also discovered that the blood destruction is greatly diminished by the use of a farinaceous diet, and increased by nitrogeneous food, hence the value of starches and fat as a diet.

ANEURISM.

The treatment of aneurisms depends upon their situation, magnitude, etc. Those outside the reach of the surgeon may be treated medically, and numerous proofs of the complete cure of abdominal and thoracic aneurisms have been recorded. The writer has dissected a thoracic aneurism which underwent complete solidification when under medical treatment some time previously, death having taken place as the result of phthisis after perfect cure of the tumor.

This is spoken of as Tufnell's treatment, the chief element in which is absolute and total rest for a period varying from three to six months. The patient is kept in bed, and on no account permitted to sit up even for an instant, though he may be permitted to turn occasionally from side to side with slowness and deliberation, the object being to so quiet the circulation that spontaneous coagulation may take place in the sac. The diet is to be carefully restricted. The total allowance of solid food is not to exceed 10 ounces daily, which may consist of well-cooked meat or fish and biscuit, and liquid nourishment to the amount of 10 ounces of milk is allowed. As a rule, stimulants are forbidden. The bowels are carefully regulated, and complete repose of body and mind as far as possible secured.

There are several drugs which have been believed to be of value in quieting the circulation and promoting coagulation. Chief among these is iodide of potassium, which must be given in full doses (10 to 30 grains three times a day) for several weeks. Acetate of lead has been used, but with apparently less benefit.

Digitalis has been from time immemorial employed to diminish the force of the circulation in treating patients with internal aneurism, but it has gradually fallen into disuse as its powerful cardiac tonic properties have been demonstrated. Aconite and veratrum viride have been

employed to quiet the heart's action, but their administration can only be carried out for a short period without doing serious mischief.

Lately $\frac{1}{5}$-grain doses of chloride of barium have been strongly recommended.

Iron may be used alternately with the iodide treatment, as it is an important matter to have the quality of the blood up to the standard, thereby favoring coagulation.

After a short time the heart's action settles down into complete regularity with a slower and weaker pulse, and, if everything prove favorable, coagulation of the blood in the sac takes place. Mercurial inunctions have proved useful, in conjunction with iodides, in syphilitic aneurisms.

Where coagulation does not occur a variety of treatments have been tried, and generally with fatal results. In the present state of our knowledge there cannot be said to be any of these lines of treatment specially worthy of recommendation:

1. Hypodermic injection of ergotine, with a view to cause contraction of the muscular coat of the aneurism and condensation of the tissues surrounding the sac. It sometimes does diminish the size of the tumor, but Broadbent has shown that it is not by acting upon the muscular fibre.

2. The injection of coagulating liquids, chiefly the chloride of iron. For internal aneurism this is unjustifiable, as there is danger of emboli and the risk of setting up sloughing in the sac and inflammation in surrounding parts. (It may, however, be useful in small varicose and cirsoid aneurisms.)

3. Acupuncture by fine needles, or the introduction of foreign bodies into the sac to cause coagulation—as horsehair, steel wire, watch springs, catgut, etc. The results have been most unsatisfactory, and nearly always fatal.

4. Galvano-puncture. This is carried out in a variety of ways. The best method being the insertion into the sac of two needles insulated with vulcanite except near to their points, the uncoated parts within the sac being so inserted as to be a considerable distance apart, the needles are then connected with the wires of a battery giving a low tension current, and the electric fluid permitted to flow between the needle points till coagulation of the blood in the sac results, as evidenced by the alteration in the shape and pulsation of the tumor. Sometimes only the needle connected with one pole, either negative or positive, is inserted whilst the opposite pole is applied outside the sac or to the skin in its vicinity.

Some cases of cure have, undoubtedly, followed this method of treating internal aneurisms; but, upon the whole, the results are far from satisfactory, and fatal inflammation, sloughing, and hemorrhage have followed.

It has been suggested that lecithin might be injected into the outer coats of the aneurism, with the view of favoring coagulation. This

substance is found as a constituent of the red blood-corpuscle; it may be regarded as a glycero-phosphate of neurin.

The pain of internal aneurisms may be lessened by narcotics like opium, morphia, and Indian hemp; and large doses of iodide of potassium sometimes give relief and render life bearable. 5 grains of antipyrine or 3 grains of antifebrin often relieve distress in a remarkable way without producing any bad consequences, and their administration may be continued for a long time.

Where the aneurism is upon any of the limbs within easy reach, there is good chance of a cure by some of the following methods:

1. Pressure upon the main trunk—digital or instrumental.
2. Rapid pressure under anæsthetics.
3. Local pressure upon the sac.
4. Ligature—proximal and distal.
5. Extirpation.
6. Manipulation.

ANGEIOLEUCITIS—See Lymphangitis.

ANGINA PECTORIS.

Attention should be directed to measures with a view to cut short the attacks, and, secondly, to remedies for administration during the attack with a view to prevent its recurrence.

During the attack, or as soon as warning of its approach is felt by the patient, there is no remedy to compare with nitrite of amyl for rapidity of action and certainty of effect. The best way to use it is to break one of the silk-enveloped, fragile glass capsules, made by Martindale, and hold it under the patient's nose so that he may inhale the vapor. Each capsule contains from 2 to 10 minims. Those containing 5 minims will be found the best for all practical purposes. Generally the attack is immediately arrested after the first few deep inspirations. Other nitrites may be employed, but the delay in their action, though but of a few minutes' duration, is a serious drawback to their use when the patient is struggling under the agony of an attack. Other measures must not be omitted. All constriction about the chest and neck must be removed, and the patient supported in the position which affords him the most relief. A rapid diffusible stimulant, like sal volatile or brandy, may be given—a large dose of spirit of nitre is the best—and warmth to the extremities may be tried. If there be a full stomach, or ineffectual attempts to vomit, a rapid emetic (30 grains of sulphate of zinc) will be useful.

The amyl may be administered by the mouth. The following is a good formula for use in teaspoonful doses in hot water:

℞.—Amyl. nit. ℥j.
Alcohol ℥ix.
Glycerini ad ℥iv.—M.

Where there is warning given to the patient a few minutes before the attack, nitro-glycerin in solution or tablet may be administered by a method to be mentioned presently.

In the intervals between the attacks, attention should be paid to everything that improves the health. If the angina is found to depend upon organic lesion of the heart, suitable treatment should be directed to the affection; if of a purely neuralgic character large doses of iodide of potassium, or iodide of sodium, will be useful. The value of these drugs in angina pectoris has hardly been sufficiently appreciated. In the writer's hands he has seen 15 grains thrice daily relieve pain and tension very decidedly. If there be reason to suspect disease of the coats of the aorta and large vessels, iodides are especially indicated. In those patients where an attack of indigestion brings on the angina, remedies directed to correct this are clearly indicated. Arsenic is often of value in those cases where the attacks are very infrequent and not severe. Full doses (5 minims) of Fowler's solution should be given 3 times a day after meals for many weeks or months.

Phosphorus has also a good reputation given in doses of $\frac{1}{30}$ to $\frac{1}{15}$ grain. It may be given alternately with the arsenic, and it is a good plan to give arsenic for one month and phosphorous during the next.

Cocaine has been found to possess the power of warding off the attacks of angina when given in doses of $\frac{1}{3}$ grain three or four times a day. Lashkevitch tried it in several cases associated with organic heart troubles, and found it caused the attacks to disappear entirely. The writer has never used the drug in angina.

Where the attacks come on often and severe, nitrites must be resorted to in order to make life bearable, and a knowledge of the pharmacological action of the different members of this class is of the greatest use to the physician in dealing with these cases. Thus the rapidity with which nitrite of amyl relieves the spasm, by causing dilatation of the vessels, is the great drawback to its usefulness when we come to deal with the case in a more permanent way, as it is proven that its effects pass off as rapidly as they come on, and after a very few minutes the amyl leaves no evidence of its action upon the vessels.

Nitro-glycerin is much more lasting in its effects, whilst Hay and Leech have shown that the action of nitrite of sodium is still more persistent. Consequently when the physician wishes to keep the abnormal high tension down for any length of time, he will select a substance more persistent in its action than amyl. The writer has, however, found by clinical experience, that much better results can be obtained by giving a very small and oft repeated dose, and he believes that in this lies the way to a successful treatment of angina.

Thus the ordinary dose of nitro-glycerin is about $\frac{1}{100}$ to $\frac{1}{50}$ grain (or 1 to 2 minims of the 1 per cent. solution) three times a day. Generally marked dilatation of the vessels and flushing of the face follow soon after each dose, but in an hour afterward nothing remains but severe headache and some malaise, and hours before the next dose is due the

tension in the vessels has assumed its usual abnormal height, and the next attack due comes on with certainty and in no way modified by the previous dose. His plan is to divide the daily amount (ordinarily given in 3 or 4 doses) into about 30 small doses, one to be taken every half-hour during the day. This is easily done by dividing the official tablets into fragments, or by getting tablets made containing $\frac{1}{100}$ grain each. The official tablets are too small in bulk and too powerful.

The patient does not, as a rule, object to slipping a fragment into his mouth every 15 or 30 minutes, especially as he soon learns that he avoids the severe headache and prevents the attacks taking place, and he soon learns to shorten or lengthen the interval as his experience of the premonitory symptoms enable him to judge of the probability of an attack. It is thus easy to obtain all the benefits we wish from the drug without producing marked flushing of the face, or throbbing of the vessels of the neck, or headache.

Nitro-glycerin acts as a nitrite, the nascent nitrous acid formed in the blood from its decomposition being more active than the nitrous acid of the nitrites.

Nitrites of sodium and potassium may be given in angina, and their dosage and administration can be carried out in the same way as suggested about nitro-glycerin. It is not convenient, however, to administer a dose of liquid medicine every fifteen or thirty minutes to a patient going about the ordinary duties of life, and, hitherto, these remedies have been only given in solution, in doses varying from 1 to 4 grains, every four or six hours. A small lozenge, containing ½ grain of either salt, might be taken every half hour with advantage.

Chloral, ether, and chloroform have been recommended to relieve pain and distress in angina, but their use is not to be recommended, especially chloral, from its dangerous depressant action upon the heart. Inhalations of oxygen have been advised, but nitrites or nitro-glycerin will generally meet all indications. Cold lotions or ice to the forehead, and mustard and turpentine to the chest, may give some relief to the paroxysm in the absence of amyl.

Quinine has been said to relieve angina in malarial cases. Pyridine inhaled, or by capsule, or in water, 10 minims, has given instant relief. Bromide of ethyl has been recommended by Squire. Atropine, belladonna, hyoscyamus, tobacco, and lobelia have occasionally given relief when the patient could not tolerate the action of the nitrites.

The application of the continuous current, beginning with 15 and going up to 20 or even 25, Leclanche elements, with the negative pole on the nape of the neck and the positive pole placed over the lower half of the sternum, has been followed with very satisfactory results in some cases, and is always worth careful trial. Some prefer to only galvanize the sympathetic upon the left side.

ANUS, Fissure of.

This painful affection, when of very long standing, must be dealt with by the knife. An incision may be made by drawing the knife across the middle of the fissure or small ulcer, dividing about a third of the fibres of the external sphincter, the bowels having been previously well opened, and the sphincter thoroughly dilated under an anæsthetic. The after-treatment is carried out upon the same principles as after operation for fistula.

Some surgeons deal with the fissure by forcible dilatation of the sphincter with the thumbs, or Ball's new operation may be performed.

Touching the ulcerated spot with the thermo-cautery, or, better still, with the galvano-cautery, is often enough to effect a rapid cure. The bowels must be kept soft by a well-regulated diet, or by the administration of one large dose of olive oil daily, or a teaspoonful of sulphur or castor oil at bed-time.

If the case be not very chronic, and not much thickening of surrounding tissue has occurred, the application of a strong caustic to the fissure or ulcer may be followed by new action being set up, which may end in healing.

1. Nitrate of silver. This is followed by such severe pain, and sometimes inflammation, that it should never be recommended.
2. Solution of chloride of zinc, 1 : 8. The stick has been used.
3. Pure carbolic or nitric acid. The first is decidedly less painful and more effectual.

Ice should be kept in contact with the anus for some time afterward and a morphia suppository be inserted, and a 4 per cent. cocaine solution should be previously applied for some time to ensure complete anæsthesia.

In ordinary cases of anal fissure the chief matter to see to is the aganizing pain and pruritus after defecation, and a host of anodynes have been recommended and praised, the vast majority of which are utterly worthless. The following are a few formulæ which may be useful: Ext. belladonnæ, 1 drachm; unguenti, 1 ounce. Or, unguentum gallæ, 1 ounce; pulv. opium, 1 drachm.

Or,

℞.—Cocain. hydrochlor. gr. xij.
Aquæ ℥j.
Lanolini ℥j.—M.

℞.—Ext. Krameriæ ℥j.
Glycerini ℥iij.
Lanolini ℥j.—M.

℞.—Bismuthi subcarb.
Glycerini q. s. ut fiat pasta } ℥j.—M.

℞.—Glycerin. acid. tan. ℥ij.
Chloroformi ℥j.—M.

℞.—Iodoformi ℥j.
Vaselin ℥j.—M.

℞.—Hydrarg. c. creta gr. xxx.
Unguenti ℥j.—M.

This list having often failed with the writer, he was led to try conium, and after repeated failure with the worthless extract of the B. P., he obtained surprising effects with an ointment prepared in the following manner:

Two ounces of the Pharmacopœial juice are place in a small evaporating dish, and permitted to evaporate slowly at a heat under 150° F. till the bulk is reduced to about one and a half or two drachms. This can be done by placing the dish on the top of an ordinary domestic hot-water cistern for twenty-four or forty-eight hours. The syrupy liquid is then carefully triturated with as much lanolin as will make the weight up to one ounce; the result is a perfectly smooth adhesive ointment of a light brown or dark fawn color and stable. 10 grains of the persulphate of iron may be added in suitable cases, as recommended by Cripps.

The ointment appears to paralyze the endings of the *motor* nerves distributed to the fine muscular layer under the surface of the mucous membrane; the reflex twitchings of this layer keep up the perpetual pain and uneasiness in diseases of the rectum and anus associated with abrasions, ulcerations, or fissures. At the same time the sensory terminals are paralyzed. After many trials the writer is satisfied that this will be found by far the best remedy for the pain of *fissures* and *ulcerated hemorrhoids*, and he has seen anal fissures heal under its use. It should be inserted well up into the bowel.

The following ointment has been much praised recently. It may be tried where other measures fail to give relief:

℞.—Cocain. hydrochlor. gr. xxx.
Acidi borici ℥jss.
Lanolini ad ℥ij.—M.

ANUS, Fistula of.

Though in the vast majority of cases of anal fistula a cure is not to be expected unless with the aid of the knife, nevertheless, in recent cases before resorting to incision, some faint hope of less severe measures being successful may be entertained. If there be a free opening of the fistulous tract into the bowel at one end and through the skin at the other, it will be found waste of time trying to cause healing of the sinus without a free incision. In attempting to effect a cure with-

out the knife the surgeon may endeavor, in blind external fistulæ, to excite a new action in the fistula. This may be done by passing a probe dipped in strong solution of chloride of zinc, or in pure carbolic acid. Nitrate of silver causes so much pain and inflammation that it should not be used.

The injection of weak tincture of iodine by a fine syringe is sometimes followed by closure of the sinus, but the writer strongly recommends the injection of the compound tincture of benzoin, as being antiseptic and stimulating and free from danger, and does not cause much pain. The galvano-cautery may be rapidly passed through the fistula. Whatever plan tried by the surgeon to cause healing of the sinus will end in failure if free drainage be not established. Mr. Cripps accomplishes this by inserting a little plug of gutta-percha, shaped by the fingers like a miniature mushroom. The stem is pushed into the fistula, and the flattened head kept in position by a little plaster; this soon widens the orifice, and permits free escape of pus. This line of treatment, though tedious and often very unsatisfactory, should be resorted to in those cases where the fistula is associated with some serious or fatal disease, as phthisis, diabetes, or hepatic cirrhosis.

Failing cure by the above method the surgeon proceeds, after clearing out the bowel, to pass a probe-pointed director from the outer to the inner opening, the point of the director is then hooked down by the finger from within the bowel and made to project through the anus, and with one clean incision all the parts between the groove in the director and the mucous membrane as divided by a curved bistoury. Should there be a cul-de-sac running beneath the mucous membrane above the internal opening it had better be also laid open at the same time. If the internal opening is so far up that the point of the director cannot be brought down through the anus, the tissues may be divided by passing one blade of a fine probe-pointed pair of scissors into the groove on the director, and the other blade into the anus, and cutting the intervening tissues. Some surgeons go further than this, and dissect out the lining membrane of the sinus and any diseased tissue appearing in the wound. This can be very seldom required in ordinary fistulæ, as the wound heals from the bottom in a short time.

By inserting a flat piece of soft, smooth wood into the rectum, and passing a shap-pointed bistoury along the groove in the director as it lies in the sinus with its point free in the rectum, the point of the bistoury, guided by the director, may be firmly sunk into the wood, and, both being withdrawn together, the intervening tissues are divided.

Those cases in which no internal opening is found are often sadly bungled in the treatment, the operator making an internal opening which may be a long way off the tract of the fistula. The best method to pursue in such cases is to introduce the probe as far as it will go through the external opening, and dissect up the fistulous tract bit by bit, and follow out any side tracts in the same way.

Longo insists upon the entire excision of the fistulous structure and

the union, by first intention of the outer surfaces, unless there be hemorrhoids, or when the internal opening is very high up. In all cases of fistula in phthisical patients, where an operation is justifiable, the tract should be scraped or touched with the thermo- or galvano-cautery.

A pad of lint, greased with boric or iodoform ointment, is inserted into the bottom of the wound, which is allowed to granulate from the bottom. The bowels should not be allowed to act till the fourth or fifth day, and then only by a dose of castor oil.

ANUS, Prolapse—See Prolapsus Ani et Recti.

ANUS, Pruritus of.

In order to treat this troublesome affection successfully, it is necessary to determine if the pruritis be caused by some focal irritation, as thread-worms, fissures, ulcer of anus, or hemorrhoids. If any of these causes are present suitable treatment must be at once undertaken, and, as a rule, the itching will disappear upon the removal of the cause. Many cases of pruritus do not depend upon any such irritation, being but the local expression of a well-marked neurosis, and, in these instances, arsenic, quinine, phosphorous, tonics, salicylates, antipyrine, or antifebrin should be given. The general health and bowels must be closely looked after, and local treatment directed to allay the extreme irritability of the peripheral nerves.

There is no better remedy than conium ointment, carefully prepared from the author's formula on page 47.

Cocaine gives short relief, and morphia suppositories—with or without belladonna—though they may relieve the itching for a time, often appear to aggravate it.

An ointment containing creasote or carbolic acid, 1 drachm; lard, 2 ounces; camphor, 1 drachm; is a safe and often effectual remedy. Where ointments do not afford relief, the writer has seen marked benefit from dusting very freely the parts in the neighborhood of the anus with subcarbonate of bismuth. Lotions are seldom successful. When ointments fail, the following may be tried:

℞.—Pulv. boracis ℥iv.
Aquæ menth. pip. ad ℨxx.—M.

℞.—Chloral. hydrat. ℥ij.
Aquæ rosæ ℨx.—M.

Or,

℞.—Zinci oxidi ℥iv.
Glycerini ℨj.
Aquæ ad ℨx.—M.

Friction and scratching should be particularly avoided.

The constant current, 10 Leclanché cells, may give marked relief, and at bedtime a small enema of 3 to 5 ounces of cold water, often acts like magic.

ANUS, Imperforate.

Sometimes the obliteration of the anal opening may be caused by adhesions of the epithelial layers around the anus, which can be easily remedied by tearing them open upon forcibly separating the nates. If there be no deficiency in the rectum, the bulging of the thin septum closing the anus being apparent, a free crucial incision will permit of the escape of the meconium, and subsequent dilatation with the finger will remedy the matter.

If, however, no bulging be evident, and there are signs that the lower portion of the rectum is absent, a dissection, beginning with an incision in the middle line behind the posterior margin of the anus, must be carried backward and upward until some bulging is observed. Sutures should connect the lower part of the newly discovered rectum to the margins of the skin wound on each side, and the bulging part be freely incised. It is of the greatest importance to carry the dissection far enough to permit suturing of the bowel to the skin, if possible, thereby preventing cicatricial contraction or stricture, and for this purpose a portion of the coccyx may be removed. Should the rectum not be reached by dissection from below, there is nothing open to the surgeon but to make an artificial anus, opening the bowel by Amussat's operation in the left loin, or in the left groin by Littré's method.

APHASIA.

The treatment of this condition will for the most part be included in the treatment of the hemiplegia, with which the defect of speech is usually associated. Absolute rest of body and mind, with very restricted animal diet and mild purgation, associated with treatment directed to the original lesion causing the hemiplegia, will be all that the physician can do. Should all traces of the hemiplegia pass away, and there be evidence that the patient, though aphasiac, retains his mental faculties still unimpaired, he may be taught to speak, and instances are recorded where recovery has been in this manner made complete.

APHONIA

depends upon causes which prevent the vocal cords meeting, hence its treatment may in one case be the treatment of paralysis of the adductors, or of any organic lesion as tumor, ulceration, anchylosis of cartilages, etc. Generally, however, complete aphonia comes under the eye of the physician as a manifestation of hysteria, and its cure is rapid and satisfactory. A *strong induced* current is the remedy for this affection. One wire of the battery is attached to a flat electrode, which

is made to rest upon the outer surface of the larynx, whilst the other wire is attached to a laryngeal electrode mounted on a handle, containing a small contact breaker. This electrode is inserted into the space between the cords, and the current turned on by pressing the button in the handle so as to produce a painful and severe shock, after which the patient may immediately cry out with a strong voice. Occasionally the application of the shock must be repeated. The continuous current is useless, and so also is a *weak* induced current. Sometimes the passing of a smart induced or interrupted current across the larynx, by applying a pole to each side of the external surface of the larynx, is enough to restore voice. (See under Hysteria.)

The writer has witnessed the successful treatment of hysterical aphonia by intoxicating doses of alcohol—a most objectionable and unjustifiable proceeding. Atropine and belladonna, pushed to the extent of producing their physiological actions, have been employed, but electricity fulfils every indication. Strong solutions of nitrate of silver, ʒj to 1 ounce, or of chloride of iron, ʒj to 1 ounce, have been applied with a brush to the larynx with rapid improvement.

For the treatment of hoarseness, see Laryngitis.

APHTHÆ OR APHTHOUS STOMATITIS.

The physician should see to the absolute cleanliness of all bottles or vessels used by hand-fed children. The local application of the old glycerin of borax is the best remedy. (Powdered borax, 1 ounce; glycerin, 4 ounces.) A little placed on the tongue or brushed upon the lining membrane of the mouth every hour or two, is fatal to the life of the *oïdium albicans*, upon whose presence the affection depends, and a speedy cure generally results. Borax and honey may be used, or a small quantity of powder, consting of powdered borax and sugar, may be dusted upon the aphthous ulcers frequently. A weak solution of chlorate of potassium (1 in 50) is also very effectual. Should the ulcers be deep or show any signs of spreading, as they may do in weak, bottle-fed children, they should be touched with nitrate of silver or nitric acid, or a strong solution of sulphate of copper or alum. If, notwithstanding this treatment, the aphthæ continue to increase, the food of the infant should be changed, or a healthy wet-nurse obtained. An occasional dose of Gray powder will do good, and, if there be much prostration, small quantities of brandy may be given, or quinine may be indicated with minute doses of iron should diarrhœa be present. A few grains of boric acid, added to each pint of milk, is most valuable. (See under Stomatitis.)

APOPLEXY.

The treatment will depend upon the nature of the lesion causing the seizure; in the absence of information, it may be wise to regard every case as caused by cerebral hemorrhage. Rest and absolute quiet are

essential, and it is a serious mistake to carry the unconscious patient up or down stairs, or to any distance. He should be placed in a bed in the room in which his sickness began, when this is possible. His clothes should be removed with slowness and care, a nurse or assistant taking charge of his head while this is being done. Placed upon his back upon a hard mattress, his head and shoulders should be elevated, and all constriction about the neck removed, and his face turned to one side so that the tongue shall not fall directly backward, and impede the breathing.

A smart purge should be given, especially if it can be known that constipation is present, and 5 grains of calomel, or 1 minim of croton oil, placed upon the tongue, will find their way into the stomach. Stimulants, always given upon these occasions, should be avoided, and no nourishment should be administered until the ability to swallow returns. If the pulse be bounding, and the carotids throbbing, and signs of high arterial tension be evident, the physician should not hesitate to bleed at once. By incising the vein in the arm, and allowing a full stream to flow from a large opening, further cerebral hemorrhage will be prevented. Leeching or cupping is worse than useless.

If the head is hot, ice should be applied to the forehead, and no harm can be done by mustard to the back of the neck. Shaking of the patient, and attempts to arouse him by shouting or flaggellation, are unpardonable, and the physician must abstain from further active treatment, and await events. The lips may be moistened with a little water or glycerin of borax, and if the period of unconsciousness be prolonged, enemata of eggs and milk may be given. It is wise to abstain from all animal food for a considerable time after swallowing power returns. As a rule, the remedies indicated in other hemorrhages, as in hæmoptysis, are useless, though some authorities recommend ergot, acetate of lead, gallic acid, digitalis and even opium. This latter should seldom or never be given.

Sometimes the physician may chance to see a patient whose premonitary headache and drowsiness may warn him of an approaching attack, especially if an attack of apoplexy or hemiplegia, or previous symptoms of softening had occurred in the same case; by brisk purging or blood-letting, and the treatment just mentioned, the attack may be warded off.

After consciousness returns, the most rigid silence and repose must be maintained, and any reaction, as shown by flushing of the face or headache and feverishness, must be met by ice to the head and a diaphoretic, small doses of aconite, combined with bromide of potassium, being very useful. At a later stage, the bromide, combined with iodide, may facilitate the absorption of extravasated blood, and small doses of arsenic may be given along with these remedies.

If there be evidence of syphilitic disease of the cerebral arteries, mercurial ointment should be rubbed in at once and continued until a

decided impression is made upon the system; afterward large doses of iodide of potassium should be given.

Victor Horsley has strongly recommended the heroic proceeding of ligaturing the common carotid artery in ordinary apoplexy in order to stop the hemorrhage; he goes even further, and states his conviction that the operation should be done as a prophylactic measure in cases where the patient has already had a slight hemorrhage.

ASCARIS LUMBRICOIDES.

The remedy for the round worm is santonin; seldom need any other drug be administered. By far the best way is to mix the powder in castor oil, and give it in doses of 2 grains to a child three years old and upward; rarely will adults require more than 5 grains. If purgation does not follow in six or eight hours, a saline cathartic or senna may be given. In the case of children who will not take castor oil, santonin may be mixed with butter, and spread upon a slice of bread, and since it is always best to give a purgative along with it, 2 or 3 grains of calomel may be sprinkled upon the butter. The writer has found that syrup of senna makes a splendid vehicle, and almost every child will take the mixture. If purging does not follow, more syrup may be given in six or eight hours. Santonin is also given in a powder mixed with scammony or rhubarb or jalap—an unnecessary and nauseous combination.

Yellow vision and orange-red discoloration of the urine very often result, but soon pass off. It should be always borne in mind that santonin in large doses is a dangerous drug, liable to produce cerebral symptoms, and the lozenges should not be left in the way of young children. Castor oil certainly minimises the danger of untoward effects.

Sulphur, spigelia, turpentine, male fern, kamala, and kousso, and various Indian vermicides are recommended, but santonin never fails. It should be given for two or three days in succession.

ASCARIS MYSTAX,

a smaller round worm, is destroyed as readily as the large round is by santonin given in the same manner and dose.

ASCITES.

The treatment of the many different diseases which cause ascites will be mentioned under the heading of each affection. For convenience the following survey is here given:

1. If the ascites be caused by the presence of malignant or other tumors upon the trunk of the vena porta outside the river, obstructing the flow of blood through the vein, little can be expected except palliative treatment.

2. If the obstruction be *within* the liver as in cirrhosis (by far the

most common cause), abstinence from all stimulants and irregular living, the free use of saline cathartics, regularity of diet, with open-air exercise and change of climate or scene, and a course of mineral acids (nitro-hydrochloric), afterward followed by iodides and sea-bathing, may effect removal of the fluid if the cirrhotic change has not proceeded too far.

The same lines, in the main, may be pursued where perihepatitis is the cause of the ascites.

Where the ascites results from the pressure of syphilitic gummata in the liver-substance or in the transverse fissure, mercurial treatment, followed by very large doses of iodides, is indicated.

Where amyloid disease in a similar way is producing the accumulation, the removal of the cause of the amyloid affection (prolonged suppuration or syphilis) should be attempted. Cancerous masses inside the liver may cause ascites, which can only be reduced by tapping.

3. Obstruction of the vena cava inferior, or of the hepatic vein, is generally outside the range of curative treatment.

4. Ascites may be a part of the general dropsy of Bright's disease, when purgatives, diuretics, and hot-air baths will be indicated. (See Bright's disease.)

5. Chronic peritonitis, secondary to some primary affection, as rupture of a cyst, ulcers in the bowels or stomach, tubercle or cancer, must be treated by attention to the underlying cause, or, failing this by tapping.

6. Diseases of the heart causing serious interference with the circulation in the large veins, leading to ascites, must be combated by remedies which aid compensation and strengthen the muscular power of the ventricles and auricles, as digitalis, broom, strophanthus, etc., assisted by purgatives and diuretics.

7. When changes in the lung lead to embarassed circulation and ascites, little can be done except in the way of palliation. Accumulation of a large amount of pleural fluid can be easily remedied by tapping with the fine trocar introduced by Southey, or by the aspirator.

Given ascites from any of the above-mentioned causes which fail to disappear after our attempts to strike at the primary affection, we may proceed to treat the ascites itself, regarding it as a local dropsy, and endeavor to produce its absorption—

1. By acting upon the local absorbents with rubefacients or counter-irritants, such as iodine or small blisters (a most unsatisfactory method), or by rubbing in the lin. potas. iod. cum sapone, B. P.

2. By purgatives—chiefly salines, elaterium, jalap, or croton oil.

3. By diuretics—like digitalis, copaiba, broom, Guy's pill, or calomel.

3. By diaphoretics—as hot-air baths, acetates, etc.

5. By absorbents—like iodide of potassium, which stimulate the lymphatics and tend to absorb effused products.

6. By tapping.

This latter method of treating ascites has for its object two very distinct aims: 1. To give relief where the amount of the accumulation is so great as to cause serious discomfort. 2. To cure the ascites where this is not depending upon a fatal cause. Thus life may be prolonged by tapping in ascites caused by cancer, and the ascites may be cured completely by repeated tappings in cirrhosis of the liver, as proved by Roberts and others, and witnessed by the writer upon several occasions.

The operation is a very simple one, and may be performed with an ordinary trocar and canula. After evacuation of the contents of the bladder, a broad binder is passed round the abdomen, and the ends grasped by two assistants, who keep up pressure as the fluid flows by pulling upon the ends of the bandage. By making a hole in the bandage opposite the middle line, and half way between the umbilicus and pubes, the site of puncture is exposed, and with a good sharp plunge the canula and trocar are driven through the abdominal walls precisely in the middle line, and half way between the pubes and umbilicus, the surgeon having satisfied himself previously that absolute dulness was present in this region. Upon the withdrawal of the trocar fluid will continue to run till the peritoneal cavity is emptied, and the pressure of the bandage will prevent syncope or weakness during the operation and after, as it should be tightly fastened and left on after the canula is withdrawn, and the puncture closed with a little plaster or collodion, or covered with lint greased with carbolic oil.

The patient, if weak, may be in bed in the recumbent posture; usually it is more satisfactory to have him seated in an arm-chair with the pail for the reception of the fluid between his knees.

The aspirator may be used, but it is wholly unnecessary. Southey's tube, which is a fine trocar and canula with several feet of India-rubber tubing attached, is a most desirable instrument for tapping the abdomen. It may be left *in situ* for many hours, and by dropping the free end of the tubing into the pail under the surface of the liquid, the fluid contents of the peritoneal sac can be safely, slowly, and painlessly syphoned away without danger of syncope, hemorrhage, or peritonitis.

After the removal of the fluid, by the judicious use of iodine with moderate pressure externally, and purgatives and diuretics internally, the reaccumulation of the fluid may, in some instances, be prevented.

ASTHENOPIA.

If the weakness of sight depends upon hypermetropia through exhaustion of the over-worked ciliary muscle in attempting to remedy the focus of parallel rays falling behind the retina, absolute rest to the eyes must be insisted upon for a time. Such measures as improve the general health should be prescribed, and the effort at accommodation should be made easy by the use of properly selected convex spectacles.

The treatment of asthenopia, caused by insufficiency or weakness of the recti muscles, will consist in the correction of any errors in refraction which may be present, after which the defective power of the recti can be overcome by suitable prisms.

Where the asthenopia is retinal or depending upon some exhaustion of the general nervous system, as may be seen after recovery from serious illness, the eyes should, as far as possible, be rested from all close work, and, if there be any photophobia, light should be modified by the use of smoked glasses. Every means of restoring the general health should be attended to, and the treatment recommended for amaurosis be used, *i. e.*, hypodermic injection of strychnine, with iron and quinine internally at the same time, or large doses of Easton's syrup may be prescribed. The spasms of accommodation may be relieved by cocaine or atropine occasionally dropped into the eye.

ASTIGMATISM

can only be remedied by the use of cylindrical lenses, which correct the unequal refraction of entering rays in the two chief meridians. There is extreme difficulty in correcting irregular astigmatism.

ASTHMA.

The treatment of this troublesome affection will resolve itself into the management of the case with a view to *prevention* of the attacks; and, secondly, to the exhibition of remedies with a view to affording *relief* in the attack of bronchial spasm. These two lines of treatment will often necessarily overlap each other, as the remedies which will effectually prevent the actual attacks will sometimes give speedy relief when the paroxysm is already established.

The preventive treatment of asthma will resolve itself into a careful examination of the cause or causes at work in bringing on attack. The avoidance of such causes sometimes settles easily the entire problem of treatment, as may be seen in those cases where the attacks are brought on by the inhalation of light dust from feathers, and by breathing air charged with various irritating vapors and emanations.

Atmospheric or climatic cause is very striking in many instances, and it is remarkable how asthmatics can live in perfect freedom in the close air of large cities, whilst a journey into the pure, clear atmosphere of the open country or seashore at once brings on a series of severe and distressing attacks, only to be successfully treated by a return to the smoky city air. In comparatively rare cases, however, the converse is true, and the treatment to be immediately adopted is to send the patient back to the region in which he has enjoyed immunity from attack. Where the disease has originated in a damp climate, the patient should be sent to a dry one, and if at the seashore, an inland spot should be selected in the same empiric way. If asthma be contracted in a low-

lying or cold situation, the physician may be led to advise his removal to an elevated or warm atmosphere.

The diet should be most carefully regulated and excess avoided. Animal food should be sparingly used. Some patients may be cured by a purely vegetarian regimen.

Food should be taken at regular intervals, and the boa-constrictor plan of one enormous meal in the evening of the day must be given up. As a rule, liquids should be sparingly used and stimulants restricted, especially malt liquors. Now and then cases may be rarely met with in which excess of starch or vegetables cause aggravation of symptoms—a free fish diet will then be indicated. The bowels must never be allowed to get constipated.

In hereditary cases prolonged gymnastic exercise, and, as far as possible, everything effecting a change in the patient's environment, must be thought of.

Where the affection is depending upon bronchial inflammation, the judicious treatment of this by expectorant remedies will be the obvious preventive measure. Where Bright's disease, joint troubles of a rheumatic kind, gout, and skin diseases, and morbid states of the blood, caused by a deficient elimination of excrementitious products by the emunctories, are the cause of the attacks, much may be done to prevent their recurrence by attention to these morbid conditions.

In some cases the presence of asthma has been found to depend upon nasal polypi, or hypertrophy of the turbinated bones, the paroxysms never returning after the removal of the local trouble. Though this cannot be a common cause, the physician should be upon the watch for it, and if there be obstruction or irritation in the nostril, it had better be removed.

The remedies used in the treatment of the attacks are legion, and, unfortunately, the physician is driven to try one drug after another; the means which afford speedy relief to one patient may aggravate the paroxysm in the next; nevertheless, there are certain remedies about whose general value there is little room for doubt.

Inhalations.—The urgent distress of the paroxysm calls for a remedy which will be quick in its action; hence those which directly reach the bronchial surface are indicated. The oldest, and perhaps the most prized, of this class of medicines is the nitre paper, made by soaking thick blotting paper in a warm solution of 2 ounces of nitrate of potash in a tumblerful of water. After drying, this paper should be burned rapidly and in large quantity in the apartment of the patient, and, as the suffocating air of the room becomes unbearable to his attendants with the nitrous fumes and smoke, the asthmatic begins to breathe with ease and comfort. It is a common mistake to burn too little of the paper, and to have the solution too dilute. Huggins's ozone paper is prepared by adding iodide of potassium to the nitre solution, and chlorate may be also added, as suggested by Thorowgood, to increase the activity of the combustion.

Stramonium and various drugs of the same class are burned in a somewhat similar way, this being the basis of most of the patent asthma cures, as Himrod's, Girdwood's, Senier's, and others. The formula recommended by Sir J. Sawyer answers well. It is made by mixing together 2 ounces of coarsely powdered stramonium leaves with 1 ounce of powdered anise fruit and 1 ounce of powdered nitrate of potash. A little of this placed upon a plate and ignited with a match gives off dense fumes, which generally afford prompt relief. Mullein (*verbascum thapsis*) is sometimes added, and a minute quantity of arsenic is a valuable addition, and powdered tea enters into most of the good asthma powders; tobacco, also, is sometimes added.

The inhalation of pyridine is often of great value; it is one of the products formed during the combustion of the stramonium powder. A teaspoonful poured upon a plate soon permeates the air of the apartment with an intensely disagreeable and penetrating odor. It is highly recommended by Sée, but patients soon turn against its unpleasant and nauseating smell.

Instead of burning stramonium and inhaling the fumes, it is a common practice to smoke it in a pipe, and there is no doubt that in this way many asthmatics get relief. A little nitre may be added to the chopped leaves, and belladonna is sometimes mixed with them.

Datura tatula, a drug of the same order, is often more satisfactory, and its action is very decided. The writer has never known a case of asthma in which it has been used without giving some relief, and often very prompt and complete relief. It is smoked like the stramonium. Both these drugs can be obtained in the cigarette form, and when arsenic is added, a very valuable remedy is obtained, which genally gives more than mere temporary relief. This is the composition of the cigarettes of Le Vasseur and Discorides; $\frac{1}{3}$ grain of arsenite of potassium is enough for each.

Lobelia is sometimes mixed with the stramonium before smoking. It enters into the cigarettes made by Espie and Joy, which also contain stramonium.

Opium is occasionally useful. In very bad attacks, where the patient cannot swallow, and where he can only inhale with great difficulty, the best treatment is to give hypodermically $\frac{1}{3}$ to $\frac{1}{2}$ grain of morphia, with $\frac{1}{50}$ grain of atropia. This combination often acts very rapidly. A morphine suppository often answers all indications, but it is slow.

Dieulafoy, at the beginning of an attack, paints the nostrils as high up as possible with a 5 per cent. cocaine solution, and sprays this over the mouth, throat, and nose for a few minutes, and if the attack does not speedily yield, he injects the drug hypodermically.

Nitrite of amyl is sometimes of great value in relieving the spasm, and it may be employed in the form of capsules (5 minims each). The vapor acts often very promptly, but its effect is exceedingly evanescent. (See its internal administration upon page 43.)

Chloroform vapor is a favorite remedy with some. Its action seldom fails, but it is not a remedy to be often repeated, and may prove fatal where there are cardiac complications. Ether, though safer, is more disagreeable, slower, and less certain to give relief.

Iodide of ethyl is strongly recommended by Thorowgood, who advises the inhalation of the vapor of 10 minims three or four times a day. It can be had in glass capsules like amyl nitrite, and, in addition to its antispasmodic power, it is a valuable expectorant. Martindale's capsules, each containing 10 minims of chloroform and 5 of iodide of ethyl, are very safe and effectual, and are highly recommended by Williams as being capable of safe administration by the patient or by nurses; they relieve the spasm and quiet the cough which accompanies it. The iodine exerts its influence upon the system long after its inhalation, and alteration in the character of the sputum soon is noticed.

Ipecacuanha wine, in the form of fine spray, is of value in asthma where there is much bronchial inflammation.

Steam inhalation alone, or mixed with terebene or menthol, or oil of eucalyptus, cajuput, creasote, or Friar's balsam, is sometimes very soothing and grateful.

When the patient can swallow, a large dose, say 30 grains of chloral, will cut short the attack if given at its very commencement, and Williams strongly recommends this drug to be taken at bed-time, or even every four hours, for several days if bad spasms are threatening.

Williams's plan is to give the strammonium, belladonna, or hyoscyamus in the form of succus or tincture, combined with the iodide of potassium, to be taken during the day, and to administer a pill of extract of belladonna or of stramonium (⅓ grain) during the night attacks. The following is an excellent combination:

℞.—Potassii iodidi	ʒij.	
Liq. Fowleri	ʒj.	
Vini ipecac.	ʒiv.	
Tinct. hyoscyam.	ʒiv.	
Aquæ camphoræ	℥viij.	M.

S.—Take a tablespoonful three times a day, in water, after meals.

Iodide of potassium holds the first place amongst drugs for internal administration in asthma. It may be given in small doses three or four times a day after an attack as a preventive of further ones, or it may be given in doses of 5 or 8 grains every four hours in the face of an expected paroxysm. Along with it any of the inhalations previously mentioned may be employed in the presence of a severe paroxysm.

Stramonium or belladonna in the form of extract, in doses of about ⅛ grain, may be given with each dose of the iodide, or ½ grain

of either extract may be given at bed-time, or a few hours before the expected attack.

Lobelia is much praised in asthma, but the writer has, through giving only small doses, generally failed with it. It is, moreover, a serious depressant to the heart in large doses. Teaspoonful doses of the ethereal tincture (1 in 8) may be tried every four hours. It will give relief if the physician have courage to push it.

Nunés has found that lobeline—the alkaloid from lobelia—may be given by the mouth in doses of 1 to 4 or 5 grains without producing the nausea or depression caused by the ethereal tincture, which owes its objectionable properties to another emetic principle. Excellent results are reported from its use.

Arsenic is a medicine of great value in the treatment of asthma. Reference has already been made to it when administered in the form of cigarette, or when mixed in minute quantity with the stramonium for burning. It is given internally with equal benefit in small doses, and may be combined to great advantage with the iodide of potassium. It is often advisable after profuse expectoration to give iron to combat the weakness and anæmia resulting from the drain upon the system. In these cases the iron may be combined with arsenic.

Mount Dore and Bourboulle waters owe their great value in asthma to the amount of arsenic in their composition.

Nitrites of soda and potash are serviceable in asthma, and if given in small and often repeated doses will prevent paroxysms in those cases associated with high tension.

Nitro-gycerin will give good results in these cases, and if administered in the minute doses every hour, as described upon page 45, excellent effects will be secured.

Apomorphine in doses of $\frac{1}{12}$ grain, where there is much bronchial irritation, may be tried, and $\frac{1}{10}$ grain hypodermically will sometimes cut short the paroxysm when internal remedies fail.

Antipyrine in full doses, 30 grains, has been given with great success at the beginning of an attack, and in small doses, 10 grains, three times daily between the attacks; it prevents their occurrence or lessens their severity.

Caffeine in doses of 1 to 3 or 5 grains has been productive of good in the treatment of asthma. Where there is cardiac failure, it is a very safe and efficacious drug, and much more satisfactory than digitalis and spartein. It can be well given in strong coffee or tea.

Alum sometimes relieves spasm of a severe nature, and it is recommended to give 10 to 15 grains dry by placing it upon the tongue. In full doses it is liable to excite nausea.

Chloral will generally give relief, and is much thought of by some physicians. Its treacherous action upon the heart is a serious drawback, and there is the danger of patients becoming enslaved by its habitual use. As already stated, it may be used to cut short a

paroxysm if given as soon as the premonitory symptoms show the approach of an attack.

GELSEMIUM, GRINDELIA, and EUPHORBIUM PILULIFERA have been tried and found successful in some cases; the two last may be given every four or six hours in doses of 1 grain to the pilular extract; 10 minims of the tincture of gelsemium may be administered four times a day.

OXYGEN or COMPRESSED AIR, in inhalation, have their advocates.

HYOSCINE, hypodermically, in doses of 1 to 2 minims of 0.5 per cent. solution, will cut short the paroxysms, and

MORPHINE, hypodermically, or CANNABIS INDICA, by the mouth, act in the same way; and PILOCARPINE, subcutaneously, has its advocates; but this latter drug acts best where there is no secretion, while hyoscine and belladonna or atropine are indicated when there is much secretion.

QUEBRACHO, in doses of 15 minims of the liquid extract, or of $\frac{1}{2}$ grain of the commercial alkaloids, known as ASPIDOSPERMINE, has been used with success in the treatment of asthma in America. It has a powerful sedative effect upon the respiratory centre, and is indicated where there is much cardiac failure.

STRYCHNINE has proved useful where there is exhaustion of the respiratory centre. Its use is, however, seldom indicated, and it may increase the distress. It has been recommended by Mayo, who gives it hypodermically with atropine.

QUININE is open to the same objection.

BROMIDE OF POTASSIUM may do some good by relieving spasm, but its action is too slow to be of much value.

TOBACCO will give marked relief (acting like stramonium when smoked), but only to those who are strangers to its habitual use.

Blistering over the pneumogastrics with cantharides or strong iodine liniment may be tried in conjunction with any of the above treatments, and galvanism (continuous or induced current) applied cautiously to the same region has been advocated.

Antispasmodics, like asafœtida or ammoniacum, and the entire range of expectorants from antimony to sulphur, have been tried with very varying success.

ASTHMA, CARDIAC.

This will be relieved by the judicious use of the various drugs mentioned under Heart Diseases.

ATHETOSIS.

The slow, irregular, deliberate movements generally seen in the arm or leg, and constituting the diseased condition known as athetosis, is not beyond the reach of treatment. Gowers has had marked success by the use of the continuous current, by placing the positive pole upon

the spine or brachial plexus, and the negative pole upon the affected muscles, and persistingly persevering for months. At the same time arsenic in moderate doses is given by the mouth, and sedatives like conium or morphine or Indian hemp may be given as indicated. Bromide of sodium, in daily doses of not less than 90 or 100 grains, should have a fair trial. It may be given in the following combination:

℞.—Sodii bromidi ℥x.
Liq. Fowleri ℥j.
Tinct. conii ℥j.
Aquæ camphoræ ad ℥x.—M.

S.—Take a tablespoonful three times a day, after meals, in a little water.

BALANITIS.

Where this condition comes on in young subjects with long prepuce, as the result of retained secretion, drawing back of the foreskin and thorough cleansing of all discharge several times daily, dusting the part with a powder consisting of equal parts of carbonate of zinc, boric acid, and powdered starch soon effect a cure. When the disease is very chronic or is apt to return, circumcision should be performed, especially if phimosis be present.

Should the inflammation have lasted long enough to produce excoriations of the membrane living the prepuce or of the surface of the glans, they should be touched lightly with nitrate of silver, nitric acid, carbolic acid, or liquor hydrarg. nit., and covered with a piece of dry lint inserted between the glans and foreskin. Where the prepuce cannot be drawn backward, a fine syringe should be used frequently to inject a stream of tepid water, colored with Condy's fluid, between the opposed mucous surfaces. Afterward a weak corrosive sublimate solution (1 : 1000), or nitrate of silver (1 : 100), or yellow wash, may be injected. If the foreskin can be drawn back, any of these applications may be inserted upon lint and left *in situ*.

Where the balanitis is part of a gonorrhœa, rarely will it be necessary to do anything but inject permanganate of potassium (1 grain to 2 ounces) round the glans and also down the urethra, curing both complaints at the same time. If there be much pain and redness, a lead and opium lotion applied outside on lint gives relief. Acupuncture is generally bad practice. Should there be a chancre or sore or ulcer causing hemorrhage, one free cut, slitting up the prepuce on its dorsal aspect, should be made, and lime-water, sulphate of zinc (1 : 100), boric acic (1 : 50), or carbolized oil (1 : 15), may be used as a dressing; or oleate of zinc or boric ointment may be applied.

The writer has permanently cured many cases by dilating the prepuce with phimosis-forceps or dressing-forceps after the irritation

subsided, even where the orifice hardly admitted a thick probe, and this, too, in adults.

BALDNESS.

For the thinning of the hair, beginning at the vertex and gradually progressing toward the forehead, or beginning in the frontal region and extending backward, much difficulty will be found in checking its progress. If there be any diseased condition of the scalp, as seborrhœa sicca or pityriasis, by the liberal use of animal or vegetable fats the progress of the affection may be effectually stayed. If the baldness be due to senile change, treatment is useless. In ordinary cases, where the health is good and where there is nothing to give a clue to the cause of the baldness, the treatment will consist of local stimulation to the atrophied hair-bulbs.

The best remedy is galvanism. A slow, continuous current passed through the scalp by brush electrodes has a powerful influence over the nutrition of the hair-bulbs in their early stage of atrophy. Shaving, shampooing, or blistering the scalp may be tried, but the most convenient and effectual plan is by the application of irritants or stimulants in such proportion that actual vesication is avoided, and a chronic congestion or erythema is habitually kept up.

Foremost among remedies of this class comes cantharides, which may be combined with other local stimulants, thus:

℞.—Tinct. cantharidis ℥iv.
Olei rosmarini ℥ij.
Spt. camphoræ ℥j.
Olei ricini ℥vj.—M.

The writer has found the following the best combination:

℞.—Olei rosmarini ℥iv.
Liniment. canthar. ℥iv.
Olei amygdal. dulc. ℥ij.
Spt. camphoræ ℥iij.
Glycerini (purif.) ℥j.
Otto de rosæ gtt. viij.
Pilocarpinæ hydr. gr. v.—M.

S.—To be well rubbed into the roots of the hair morning and night.

Gull's linimentum myristicæ (1 part of expressed oil of nutmeg to 3 of olive oil) is a safe and mild stimulant.

Innumerable drugs have been from time to time praised as specifics—paraffin oil is, perhaps, one of the best. The writer has seen the following pomade produce good effects; he has devised this formula after many trials. It may be tried where lotions cannot be used:

℞.—Pilocarpin. hydrochlor. gr. xx.
Aquæ destillatæ ʒij.

Fiat solutio et adde

Lanolini puriss. ʒx.
Olei petrolei ("snowflake") ʒvj.
Olei bergamot. ʒss.
Olei verbenæ. ʒss.—M.

Jaborandi and pilocarpine appear to possess some influence over the nutrition of the hair, and they have been even administered with this intention, and given hypodermically, but the results are doubtful. Arsenic certainly has some effect upon the hair when administered internally.

Ammonia is a good stimulant, and may be applied with cantharides.

℞.—Ol. amygdal. dulc. ℥ij.
Aquæ ammoniæ ʒij.
Tinct. cantharidis ʒss.
Spt. myristicæ ℥j.—M.

Capsicum, mustard, euphorbium, and strong acids have been used, but their application is not to be advised. The volatile oil of mustard, if very well diluted, is of some value.

℞.—Olei sinapis volat. ʒij.
Olei petrolei ℥j.
Olei olivæ ℥ix.—M.

For syphilitic baldness; in addition to the usual constitutional treatment, a pomade made by adding 2 drachms of white precipitate to 4 ounces of marrow is of value.

Upon the supposed parasitic nature of some cases of common baldness all sorts of germicides have been used. They can only be of use when applied in such strengths as to cause irritation. Sulphur ointment has been recommended. It is a most disagreeable application.

Baldness due to alopecia areata is believed by a few to be parasitic, and is treated by them with remedies such as are used for ringworm, as chrysophanic ointment, corrosive sublimate (1 : 200), carbolic acid, sulphur, or iodide of sulphur ointments. It appears that these applications do good, but probably by their local stimulating action.

The strong solution of the nitrate of mercury, lightly brushed over the spot, is often followed by speedy changes in its appearance, and the writer, though not believing in the parasitic nature of the affection, has seen better results from painting over the patches with strong sulphurous acid than from any other treatment, save constant blistering with cantharides. After a time, if there be no signs of the growth of hair upon the bare patch, the blistering should be stopped, and the milder

stimulating compounds previously mentioned may be applied. Some authorities lay great stress upon food supposed to stimulate the nutrition of the nerves, as fats, phosphates, crushed wheat, and fish ; and with the erroneous idea that such substances as Parrish's syrup and other phosphates can supply free phosphorus, others recommend these drugs internally. Phosphorus, arsenic, strychnine, pilocarpine, and cod-liver oil are advocated.

BED-SORES.

Bed-sores may be prevented in the majority of instances by careful nursing and great cleanliness. Where they may be expected, as in tedious fevers, paralysis, and bladder cases, all pressure must be avoided over the prominences of the sacrum and trochanters by the use of water beds and air cushions, avoiding feather beds and under-blankets and mackintoshes as far as possible, depending upon prompt and frequent changes of smooth linen draw-sheets.

The skin should be well cleansed with Pears's soap and water, and after drying with a sponge or soft cloth, it should be dabbled over with eau de cologne, or camphorated spirit, or a solution of 30 grains of corrosive sublimate in 1 pint of spirit, and dried, after which finely-powdered Fuller's earth, zinc oxide, or zinc carbonate may be dusted over it. If there be a tendency to dryness of the skin, a little lanolin may be rubbed in instead of the powder. If redness has already become permanently established, painting over the spot with flexible collodion may ward off the threatening abrasion. If this has, however, already occurred, a piece of soap plaster, gently warmed, should be placed over the spot, and the use of wet applications stopped. An ointment composed of 30 grains of finely-powdered camphor and 1 ounce of zinc ointment is safe treatment at this stage, and may prevent the abrasion becoming an ulcer.

If sloughing has already taken place the application of poultices of linseed should be continued only until the slough separates. It is a sad mistake to apply these poultices when too hot, thereby lowering the vitality of the surrounding skin, and between the application of each the sore should be syringed or douched with lotions of alum, (1 : 100), chlorate of potash (1 : 100), carbolic acid (1 : 40). Should there be much fetor, solution of corrosive sublimate (1 : 200) may be used, or the slough may be dusted over with powdered boric acid.

After the separation of the dead matter, and when the sore is made clean and sweet, it is to be treated as an ulcer by applications of any of the previously mentioned lotions applied upon lint, covered over with oiled silk, held in place by strips of soap plaster. The best lotion in the majority of cases is spirit lotion (1 : 2).

The continual moisture of the lotion, in many instances, will cause some irritation of the healthy skin under the oiled silk, and in these cases an ointment is better. The favorite is a pomade made by mixing 2 ounces of Basilicon ointment with 2 ounces of balsam of Peru.

Boric, carbolic, or salicylic ointments, may be used, or calamine, zinc oxide, or iodoform may be applied as an ointment or dusted over the sore in fine powder.

Bird's plan of healing ulcerated bed-sores in paralysis is very highly spoken of by those who have used it. He places a thin plate of metallic silver over the ulcer, its margins just covering over the margins of the raw surface and not projecting to any extent upon the sound skin; to the silver is attached a wire six or eight inches long, which is attached by its other extremity by a small disc of zinc, which is separated from the skin over which it lies by a piece of wash-leather soaked in vinegar. Healing is very rapid under the galvanic action thus set up.

Under the article on ulcer will be found a list of the various applications which may be used for the healing of the sore if the above fail. While the healing process is going on it will be advisable, and in some cases absolutely necessary, to remove all pressure from the sore; the various air and water cushions will generally prove useless. The best plan will be for the physician to direct the nurse to make a small cushion out of soft, old linen or calico, and stuff it with sheep's wool carefully teased out. This appliance can be shaped to the irregularities of the part, with a circular opening in the centre opposite to the bed-sore.

BLADDER, Acute Inflammation of.

The treatment of this affection will depend upon the cause. Thus if the cystitis be the result of an extension backward of a gonorrhœa —a common cause—absolute rest in bed and warmth, hot baths or hot hip baths (t. 105°) frequently repeated, and a suppository of ½ grain of morphia or ½ grain of green extract of belladonna should be given to allay pain and spasm.

Stimulants and solid food must be stopped, and coffee and tea forbidden. The diet, while the acute stage lasts, should be entirely milk, or milk diluted with barley water, and kali water, iced, if the patient can take it. A large linseed poultice covering the lower part of the abdomen gives relief.

Hyoscyamus, in doses of 20 to 40 minims of the tincture, should be given every four or six hours, according to urgency.

Opium may be combined with it in doses of 15 minims of the tincture. This may be given in infusion of linseed freshly prepared, to each small cup of which from 20 to 30 minims of liquor potassæ is added. There need generally be no fear of increasing the pain by taking moderate amount of diluent drinks. Injections for the gonorrhœa should be stopped, and not resumed until urgent symptoms subside, then weak, warm injection of water, colored with Condy's fluid, may be commenced, gradually and cautiously increasing the strength until 1 grain of permanganate to each ounce can be painlessly used.

Where the acute cystitis is the result of an attack of gout, smart saline purges, followed by colchicum and large doses of bicarbonate of potash, are indicated.

The attack sometimes follows the application of a blister to some part of the body, and, when the first signs of cystitis supervene, the blister should be instantly removed and a large warm poultice applied over its site, 40 minims of laudanum per rectum given. Hyoscyamus internally, and hot hip-baths and diluent drinks soon relieve all trouble in a few hours. (See under Strangury.)

When the attack follows irritation from injury or stone, the removal of the exciting cause, after relieving pain by the above treatment, should be attempted. (See Stone in the Bladder.)

BLADDER, Chronic Inflammation of.

The cause, if possible, should be determined and treated. The causes are: (1) Atony of the bladder, permitting a quantity of urine always to remain behind after micturition, (2) calculus, (3) tumor, (4) stricture, (5) enlarged prostrate, (6) paralysis affecting the spinal centre, (7) uterine affections, (8) gout, etc.

In those cases where the immediate removal of the cause is not possible, the first indication is the sympathetic use of the catheter. This is imperative, as pain and frequency of micturition will not disappear until the complete evacuation of the contents of the bladder. The intervals between the use of the catheter are to be gradually lengthened, until morning and evening catheterization be sufficient. As a rule, very considerable relief will attend the removal of all the urine contained in the bladder, and the catheter need not be again used until *slight* symptoms of distress are felt. After the attack of cystitis seems to be passing off, as the urine gets clear the catheterization may be suspended. If enlargement of the prostrate or central nerve lesion be the cause, the habitual use of the catheter will probably last during the patient's life time. Soft India-rubber instruments should be used, and, as a rule, oil should not be employed for their constant lubrication, as its action upon the rubber is such as to make the instrument brittle and liable to break off in the bladder or passage. There is nothing so good as a lubricant as the glycerin boracis (B.P., 1867); it is a good antiseptic, and sterilizes the instrument each time —a matter of vital importance.

Occasionally, but not often, it may be necessary to tie in a catheter, and then only a rubber one should be used.

Injections into the bladder after washing out the organ are in favor with most surgeons, and many substances are used for this purpose, and several instruments are recommended. The best, and one that answers every requirement, is a couple of feet of India-rubber tubing, such as is used for children's feeding bottles, attached at one end to a small glass funnel, at the other by means of a bit of fine glass tubing it is connected with a large-sized rubber catheter. Upon the patient

lying down and inserting the catheter in the bladder he draws off the urine, and by elevating the funnel and pouring in a few ounces of tepid water it finds its way into the bladder, after which depression of the funnel permits it to flow out again, and thus every particle of mucus can be washed off the coats of the viscus. Any of the following solutions can then be poured in, and the bladder thoroughly washed out with them, only permitting 2 to 4 ounces to remain in at once. They should not be used if there be much pain or tenderness:

Boric acid, 1 to 2 drachms; water, 10 ounces.
Borax, 2 drachms; water, 10 ounces.
Carbolic acid, 1 drachm; water, 10 ounces.
Nitric acid, as much as will make water pleasantly acidulous to the mouth.
Quinine, 15 grains; dilute nitric acid, 20 minims; water, 10 ounces.
Nitrate of silver, 3 grains; water, 10 ounces.
Sulphate of copper, 5 grains; water, 10 ounces.
Sulphate of zinc, 5 grains; water, 10 ounces.
Permanganate of potassium, 3 grains; water, 10 ounces.
Resorcin, 1 drachm; water, 10 ounces.
Chloral hydrate, 10 grains; water, 10 ounces.
Pure castor oil, gently warmed.
Creolin, 1 drachm; water, 10 ounces.
Pure, fresh, healthy urine.

Of these, boric acid is unquestionably the least irritating, and though its internal administration renders washing out of the bladder seldom necessary, still it may be occasionally used with freedom, and a quart of the solution may be used at one sitting in small quantities at a time.

A large number of drugs possess considerable power over the bladder and urinary secretion as they pass out after being administered by the mouth, and much benefit may be obtained by their administration in chronic cystitis.

By far the most valuable of these is boric acid, and there are few more surprising results in the therapeutics than is to be seen after a few doses of this drug. Urine, which is passed ammoniacal and so highly offensive as to polute the air of the sick room, may, in forty-eight hours or less, be voided clear and free from every trace of smell after 15 grains of the acid three or four times a day in a glass of water or milk.

The administration of this drug will, in the great majority of instances, enable the surgeon to dispense with washing out and injecting solutions into the bladder. After some days the dose may be diminished to 5 grains three times daily. The only objection to its administration rests in its liability to irritate the stomach and destroy the appetite. This is less likely to occur if it be largely diluted, and the writer dilutes 10 grains with a half pint of kali water or with one

pint of milk; under these precautions it may be taken for many months without inconvenience.

Buchu, in doses of a large wineglassful (3 to 5 ounces) of the infusion three or four times a day, is indicated in recent or acute cases; if improvement does not soon follow, its use may be suspended, and

Triticum repens, made into a decoction by boiling 4 ounces of the *fresh* rhizome in one quart of water and taking the entire quantity during the twenty-four hours, may be followed by marked improvement.

Sir H. Thompson advises, in chronic cases with much mucus and alkaline urine, either the infusion of

Alchemilla arvensis, 2 drachms in 5 ounces of water, three times a day; or,

Uva ursi, in doses of a wineglassful of the infusion; or,

Pareira brava, in doses of a wineglassful of the decoction three or four times a day.

Any of these vegetable remedies can be most effectually combined with 5 grain doses of boric acid.

Zea mays (drachm doses of the liquid extract) is a drug of much value.

Alkalies, as bicarbonate of potash or the liquor potassæ, are of great value in cystitis, and may be given in combination with any of the above, or with hyoscyamus.

Benzoic acid, in doses of 10 to 20 grains, in passing out as hippuric acid, acts as an antiseptic, and also diminishes the alkalinity of the urine. Its various salts may be administered in the same way.

Mineral acids have scarcely any appreciable power in diminishing the alkalinity of the urine in cystitis, and their administration with this intention generally ends in disappointment.

Hyoscyamus is a remedy of great value for the relief of pain in cystitis. (See under Acute Cystitis.)

Belladonna, chiefly in the form of suppository, has been before referred to, as has also been morphia. Belladonna, in small doses by the mouth, is often successful in mild chytitis in children.

The diet and general care of the patient should be upon the same lines as indicated for acute cystitis: Change to a warmer and drier climate, with the use of natural alkaline water like Vichy or Vals, or the sulphur waters of Bonnes or Harrogate, may do much to restore the patient. Avoidance of stimulants, exposure to cold and wet, and fatigue of body, especially long carriage or omnibus drives, must be carefully guarded against. The catheter is to be used to ensure complete evacuation.

Cantharides, turpentine, eucalyptus, santal, copaiba, and cubebs are often administered, but their effects are uncertain and so often followed by renal irritation that they should be administered with great caution.

BLADDER, Atony or Atrophy of.

The treatment of this affection in its early stages will generally mean the removal of the obstruction to the flow which has caused the distension and wasting of the muscular coats. In the later stages the treatment will be that indicated for chronic cystitis. The habit of retaining the urine for too long a period must be abolished, stricture of the urethra must be dilated, and accumulation of the feces in the rectum should be cleared out. Tumors, calculi, or enlarged prostate will require attention, and those spinal lesions (sometimes caused by injury) or cerebral affections which lead to retentions will require appropriate treatment.

Drugs are of little value in improving the tone of the bladder muscle, but some improvement may be obtained by general hygienic measures and full doses of strychnine and iron, or Easton's syrup, ergot, or minute doses of cantharides. The constant current is of undoubted value; but judicious catheterization, with clean rubber instruments and the administration of remedies to keep the urine normal, as enumerated under the treatment of chronic cystitis, will make catheter life tolerably comfortable.

Dr. Wales had obtained excellent results from 2 ounce doses of the infusion of golden rod (*solidago virgaurea*), 1 to 20, every four hours.

BLEPHARITIS OR TINEA TARSI.

The first object is to remove the minute scabs or crusts before applying any remedy. This can only be done by carefully bathing the eyelids with a *warm* alkaline lotion (2 drachms of bicarbonate of soda to 1 pint of water) for half an hour till the crusts come easily away, after which the margin of the lid is carefully dried, and an ointment of the yellow oxide of mercury (10 grains to 1 ounce of vaseline) freely smeared over it. This treatment must be carried out twice a day at least, and must be persevered with for weeks till every trace of the disease disappears. Should it fail, which is seldom, unless through carelessness, the edge of the lid should be painted with strong solution of nitrate of silver (1 drachm to 1 ounce), and the ointment continued. Should there be much inflammatory symptoms, epilation is of great value, and recent cases may be speedily cured by removing the hairs and applying the mercurial ointment just mentioned. The disease often occurs in the anæmic and strumous, and sometimes local remedies are of no avail, unless after a prolonged course of iron, combined with cod liver oil, extra feeding, pure air, and a change to the seaside.

BOILS.

The patient should have careful attention to general health—a generous, plain, unstimulating diet, without alcohol or wine in the early stages. There is nothing influences the growth of boils, in the writer's opinion, like a diet into which onions largely enter. The spanish onion

boiled till tender in an open vessel, may be eaten *ad lib.* at supper or breakfast, or at both times. The gentle purgation following is also an advantage. Some benefit has been reported to follow dose of $\frac{1}{10}$ grain of sulphide of calcium as a prophylactic in the early stages, or to assist maturation at a later period. There is, however, little evidence to show that it behaves in this paradoxical way. Sulphur waters (Bonnes, Harrogate, etc.) may be given with benefit. Yeast, in doses of a tablespoonful of the fluid form, three or four times a day before meals, is affirmed to be efficacious in preventing boils when threatening.

Flour (wheaten) in tablespoonful doses, mixed up in cold water, is stated to effectually prevent the development of boils.

Quinine, in doses falling short of cinchonism, is also used, and iron, to the point of saturation of the system, has its believers.

Upon first appearance of a boil, it is worth while to scrape the skin over it with a sharp scalpel till a drop of blood appears, or pluck out the hair growing in the inflamed follicle, as it is said these means may often prevent suppuration. The spot should then be brushed over with (1) the strong solution of the acid nitrate of mercury, or (2) collodion, or (3) strong solution of nitrate of silver (1 drachm to 1 ounce). Sometimes one or other of these remedies causes abortion of the boil, but their effects are very uncertain. It is better to either cover the boil at this stage with a little extract of belladonna rubbed down with glycerin, or to apply a small piece of belladonna and opium plaster or galbanum and opium plaster, in the centre of which a hole may be cut when the boil points. Should there be much pain or throbbing, a good linseed poultice, smeared over with boric acid ointment, should be applied. Wet applications covered with oiled silk should be avoided owing to the danger of crops of small boils appearing where the silk is in contact with the healthy skin. For the same reason it is very important that the poultice should not be covered with mackintosh or gutta-percha tissue.

Sometimes strapping the boil with strips of plaster affords relief, at other times it occasions great pain. An incision should be made if the tension cause constitutional disturbance; one moderately free wound will do good; the crucial incision is needless. Pain may be somewhat relieved by the application of cocaine, and the pain of the incision may hardly be felt if strong carbolic acid be previously painted over the boil.

The application of a poultice to clean the sore at this stage assists matters, and the boil may now be dressed with any antiseptic ointment ar lotion, the former being preferable.

The early incision and the sparing use of poultices have certainly an influence in retarding the progress of successive crops of boils.

The injection of carbolic acid into boils in their early stage is painful and not free from danger. A 5 or 3 per cent. solution injected into the centre of the boil can do little harm and may stop the suppuration.

During the suppurative stage, if many boils be present, the diet may be enriched, stimulants and strong soups may be given, and change of air may be advisable.

Iron and arsenic are now useful, or iron and chlorate of potash may be freely administered. Sulphites and phosphate of soda have their advocates. Saline purgatives and sulphur waters may be given at a later stage.

Boils in the ear are exceedingly troublesome and very painful. Grosch has found that a solution of acetate of alumina (1 : 4 of water) causes the speedy abortion of furuncles in the external auditory canal. The writer has had great satisfaction with the B. P. solution of corrosive sublimate dropped into the ear twice a day; after its instillation cotton wool soaked in it should be left in the canal. This treatment will effectually prevent the return of the affection. Boric acid may be insufflated, or a strong alcoholic solution instilled.

BONE, Diseases of—See Caries, Periostitis, etc.

BREAST, Cancer of—See Cancer.

BREAST, Abscess of, and Inflammation of—See Mammary Gland.

BRIGHT'S DISEASE, Acute.

In acute Bright's disease the patient should be at once placed in bed between blankets, and enveloped in a sleeping suit of light flannel. The diet should consist entirely of milk, stimulants in every form, animal food, and eggs being at first rigidly prohibited. After the very acute symptoms pass off, any farinaceous food may be allowed. The chief indications for treatment are to act upon the skin, bowels, and kidneys, so as to cause elimination of the products hurtful to the economy. Sometimes the indications may be limited to the removal of these products by the skin and bowels alone, if the kidneys be in a condition in which their functions are for the time in suspension.

Diaphoretics.—Drachm doses of the liq. ammon. acetatis, with 20 minims of spt. æther. nit., is a harmless and often efficient way in which to start the action of the skin in mild cases. Should there be feverishness present, 1 minim of the tr. aconiti may be added, and the dose administered every two or three hours.

℞.—Tinct. aconiti		♏x.
Potassi citratis		ʒiv.
Aquæ ammon. acet.		℥ij.
Aquæ camphoræ	 ad	℥viij.—M.

S.—Take a tablespoonful every hour.

Generally it will be safe to assist such a diaphoretic by copious draughts of warm whey.

In severe cases diaphoretic drugs are not to be depended upon.

Baths are much more certain in their action. The ordinary hot bath (104°) may be used, but is objectionable owing to the exposure entailed and the difficulties in getting the patient into and out of the bath, which, very often, cannot be brought into the sick-room. Leibermeister places the patient in a hot bath at a temperature of 100°, and adds hotter water till the temperature reaches 106°, in which he keeps the patient from twenty to sixty minutes, after which he is taken out, rubbed down, and packed in sheets or blankets for two or three hours till a profuse perspiration takes place.

The writer, always in severe cases where there is any threatening of uræmia, has a large vessel brought into the sick-room into which water, almost boiling, is poured till it is half filled (into this a few ounces of mustard may be stirred); a large, thick double blanket is thrown in, and in a few minutes wrung out by the attendants, so that the superfluous moisture is got rid of. In this the patient is carefully enveloped —all the body being included save the head and face. There is no danger of scalding owing to the rapid reduction of heat caused by the evaporation from the large surface of the flannel, and indeed there is generally some difficulty in having the blanket warm enough. It should be as hot as the hands of the attendants can bear when wringing it out.

After envelopment, the patient should be placed upon a mattress or palliasse of straw and covered with sheets and blankets for a couple of hours till profuse perspiration occur. He is then rubbed dry and placed between warm blankets. When in this pack he may drink freely of any warm diluent like barley-water or whey.

The hot-air bath is more convenient though not so certain; it is generally all that is necessary in mild cases. Of it there are two forms—one consisting of a large copper spirit-lamp enclosed by gauze, like a Davy lamp, and surrounded by a cradle of sticks to keep off the bedclothes. It is lighted and placed between the patient's knees, and the bedclothes tucked in lightly all round him, the head and face only being left free. Half an hour generally produces a very free perspiration. The writer has seen one death caused by burns through the negligence of a nurse in not watching the patient, but with ordinary care an accident is hardly possible with a quiet, conscious patient. A second form of bath can be obtained from most surgical instrument makers, in which the spirit-lamp is placed on the floor of the room, and the heated air caused by the combustion is conveyed under the bedclothes by a wide, tin telescope tube. Perfect safety is thus obtained if the nurse does not upset the lamp and spill the ignited spirit over carpets and bed-hangings.

Sir J. Simpson's "poor man's bath" is made by filling a number of soda water bottles with very hot water, and drawing over each a woolen stocking squeezed out of hot water, and placing them alongside the patient under the bedclothes.

In ordinary cases the Turkish bath is not available, but it may be used in chronic Bright's disease with advantage.

The hot pack or hot-air bath may be given daily, or even oftener, where uræmia is threatening, or where anasarca is very extensive. They must, however, be used with some discretion, especially if there are marked signs of cardiac failure or great dyspnœa.

Should all these methods fail in inducing free and abundant perspiration, the physician has still a most powerful diuretic in pilocarpine, and the writer finds that if administered whilst the patient is in the pack, it acts more rapidly and safely. From $\frac{1}{8}$ to $\frac{1}{2}$ of a grain (generally $\frac{1}{4}$ of a grain will be sufficient), when injected subcutaneously, in a few minutes produces copious sweating and a very great discharge of saliva. It may be given by the mouth just before the patient is placed in the pack, and a dose of sal volatile will overcome any depressing effect upon the heart.

Diuretics.—It is advisable to administer mild diuretics, so as to wash out the kidney tubes and flush away casts and epithelial *débris*. The best remedy is water in copious draughts, or any diluent drink like barley-water or linseed-tea, hot or cold, as the patient wishes.

Spt. æther. nitrosi and the citrate or acetate of potash are harmless diuretics, whilst squill, broom, gin, juniper, and others possessing a stimulating power, are not so safe.

Digitalis is the safest and best diuretic, and generally admissible, and so is caffeine after the subsidence of the very acute stage. Where the tension is high and urinary secretion scanty, the best remedy will be found in nitro-glycerin in doses of $\frac{1}{6}$ minim of a 1 per cent. solution every hour. It often materially increases the secretion of urine with promptness. It must be remembered that the action of diuretics in Bright's disease is most uncertain end unreliable, and the physician must trust to the skin and bowels for the elimination of products whose presence in the blood may lead to a fatal issue.

Purgatives.—Only those are indicated which cause copious watery motions. Elaterin and elaterium are generally given in desperate cases, and it is in such cases that absorption from the stomach may be in such a condition as to render their action void. They are, therefore, not to be relied upon. A dose may have no effect, which in health would cause serious purging, and if a second dose be administered, dangerous prostration might supervene should the absorption of both doses take place eventually.

Pulv. jalapæ comp. in drachm doses is the favorite remedy, but the best results will be always obtained from sulphate of magnesia.

℞.—Magnes. sulph.	℥ij.
Magnes. carb.	ʒj.
Aquæ menth. pip.	℥xij.—M.

S.—A wineglassful every two or three hours till purging supervene, then half a wineglassful every four hours to keep up the discharge of watery motions.

Another method of giving this drug in cases of great anasarca will be presently mentioned.

Calomel must not be administered, owing to its dangerous depressant action in kidney diseases.

Other symptoms must be met by appropriate treatment. Thus, pain in the renal region required the application of hot poultices, and if the inflammatory action runs high, local bloodletting by leeches or wet cupping over the loins must be resorted to; and should there be fever with a full, bounding pulse, suppression of urine, and signs of approaching coma or convulsions, a vein in the arm should be opened and ten or more ounces of blood allowed to flow freely from a large orifice. Bozzolo after bleeding dilutes the remaining blood by the subcutaneous injections of sterilized saline solution or serum.

After the acute symptoms have subsided, counter-irritation over the loins may be called for. Mustard answers every purpose, and blisters should never be employed. Cupping is unobjectionable. Should anasarca remain, the action of digitalis may be kept up, combined with the more stimulating diuretics, as broom and juniper.

The following is a splendid combination at this stage:

℞.—Tinct. ferri chlor. ʒvj.
Liq. ammon. acet. ℥iij.
Aquæ camphoræ ʒvj.—M.

S.—Take a tablespoonful in a wineglassful of water every four hours.

The knowledge that potassium salts increase very greatly the danger of uræmia should always lead one to use the soda salts in the treatment of Bright's disease. In this way, owing to the poverty of milk in potassium salts, its value in uræmia is supposed to depend.

Bouchard has insisted upon intestinal disinfectants, as he finds much of the toxic substance found in the blood has been reabsorbed from the bowel, and he thus gives charcoal, iodoform, and naphthalin.

Jaccoud, noticing that free work in the open air and a sojourn in compressed air both diminish the toxity of the urine by one-half, has with success given inhalations of 10 litres of oxygen three times a day; and Carter is satisfied that this treatment is as useful in practice as it is rational in theory.

Salicylates and nitro-glycerin may be resorted to in the later stages should arterial tension increase, and iodides are useful also.

The treatment of various complications will be mentioned under chronic Bright's disease.

BRIGHT'S DISEASE, Chronic.

The general treatment of the chronic affection arising out of the acute disease, or of the affection which has apparently begun in the chronic form, will differ but slightly in degree from the treatment mentioned under acute Bright's disease. The diet should be chiefly

milk; eggs and strong animal foods, or concentrated soups, or stimulants, must be allowed only in small quantities. Fat and carbohydrates are admissible in full quantities.

The patient's body, when not in bed, must be enveloped entirely in flannels, and damp, cold, and rain avoided. A dry, equable warm climate, in which an outdoor life may be safely pursued, is a great desideratum.

The artificial koumiss, mentioned upon page 23, is a valuable adjunct to the diet in all stages of the disease.

The same indications are to be met in the chronic form of the disease as were discussed under the acute affection. Diaphoretics, diuretics, and purgatives are to be judiciously administered.

The physician will find at the bedside that he is very often called upon to treat subacute or acute attacks occurring upon the top of a well-marked chronic affection, and the indications are precisely alike, and must be dealt with as promptly as if the attack were one of acute Bright's disease happening to a healthy individual.

If the patient be well enough to go about, the action of diaphoretics must, to a great extent, be suspended, and the physician must be content to keep the skin in a healthy state of activity by very warm clothing, and a hot bath or hot pack at night. Diuretics are of more value and more to be relied upon than in the acute form. Digitalis is always safe, and may be given in full doses; the tincture is the best preparation when the diuretic action of the drug is required, as it contains digitalin, digitalein, and digitoxin, by which the maximum effect is produced upon the kidney, because *all* the bloodvessels of the body are contracted, whilst those of the kidneys are dilated—a result not to so easily obtained when the infusion is administered.

Notwithstanding the incompatibility between digitalis and iron, the combination of their tinctures makes a valuable, though inelegant mixture, especially indicated in the treatment of this disease.

Diuretin gives excellent results.

Caffeine is a good diuretic in these cases, and some authorities believe that it diminishes the albumin and increases the elimination of solids. The writer, in a series of carefully conducted experiments, failed to find that it had any influence in increasing the amount of urea daily excreted in chronic Bright's disease. It may be combined with digitalis or spartein.

Cannabis indica has been found of much service, especially as opium is contra indicated. Sometimes it exerts decided diuretic action, and leads to rapid improvement where there is much blood in the urine, though the rationale of its action is obscure.

Copaiba, turpentine, and cantharides are powerful diuretics, but should be seldom employed, even in the most chronic cases, as irritation of a serious nature may follow their administration. It is fashionable to order them in infinitesimal doses which can do no harm.

Jaborandi and juniper are valuable remedies; the former is indicated where there is much blood in the urine, and the latter where blood is absent and the total amount excreted is small.

Nitro-glycerin will sometimes start the kidneys to act after all other remedies fail. Half a minim of the 1 per cent. solution may be given every hour for six or eight doses, then every second or third hour.

Benzoate of soda has been found very serviceable (15 grains four times daily) in threatening uræmia. The best purgatives are salines, and magnes. sulph., as mentioned under the acute affection, is also the most reliable cathartic in the chronic disease. Cream of tartar is both diuretic and purgative. Purgation can be safely kept up by small doses frequently repeated over long periods. Massage is of the greatest use in chronic dropsy, as pointed out by Stewart.

With a view of diminishing the amount of albumin, a host of specifics are vaunted; their action is uncertain, and at the best very slight. Lead acetate in small doses, lime-water, belladonna, fuchsin (1 grain pills for children), gallic and tannic acids, astringent iron preparations, oxygen inhalations, common salt in 20-grain doses, chloral, benzoate of soda, ergot, arsenic in 3-minim doses of liquor over long periods, hydrastis, and chimaphilia. The above is but a few of the innumerable remedies supposed to diminish the amount of albumen in chronic Bright's disease. When such a result follows, as it doubtless often does, it is possibly owing to the general tonic action of the drug in improving the languid circulation through the renal capillaries. Iron, combined with digitalis and nux vomica, upon the whole will give the best results. Iodides are also very valuable in all chronic cases.

Where the anasarca continues to increase, and threaten life, notwithstanding the free use of diuretics, hot-air baths, and purgatives, relief may be obtained by acupuncture of the most dependent parts. The skin should be smeared over with lanolin or boric ointment, and a number of smart punctures made with a sharp glover's needle, whose point may be freely moved about before withdrawal. Over the malleoli, dorsum of foot, or calf are the best situations, and the limb should be enveloped in warm, moist, flannel cloths, and any tendency to an erythematous condition of the skin met by appropriate remedies. Strict antiseptic precautions are essential. A Southey's minute canula may be left *in situ*. Should the dropsy continue to increase, the physician has still another remedy to try. Hay recommends that 2 ounces of magnes. sulph., dissolved in 2 ounces of water, be given when the alimentary canal is empty, after fasting and total abstinence from fluids for twelve or eighteen hours. Sometimes enormous quantities of fluid are excreted from the bowels by this method, and the writer has seen a water-logged patient rescued upon more than one occasion by this means. It, however, unfortunately fails in many cases, owing apparently to the condition of the alimentary canal.

Calomel is lately recommended by Mosler for the dropsy and uræmia,

but it is a dangerous remedy, whose action is exceedingly difficult to control. Small doses have proved fatal.

Where uræmic convulsions come on nothwithstanding the above treatment, large doses of bromide of sodium and 30 grain doses of chloral may be given by the bowel, a hypodermic dose of ½ grain of pilocarpine whilst in the hot pack, and the inhalation of chloroform or ether, afford the best results. Venesection may be tried with advantage.

These various measures, combined with the prompt emptying of the uterus, gave the best hope of life in convulsions coming on at the puerperal period, in such cases blood-letting is a valuable remedy.

The various symptoms and complications occurring during the disease will be combated upon general principles. Thus ascites, hydrothorax, and hydropericardium should be treated as part of the general dropsy, and if serious embarrassments result from them the fluid must be drawn off with the trochar and canula, or by aspiration.

Œdema of the lungs must be treated by the methods employed for the general anasarca, and by sinapisms to the chest, and by the *concentrated* solution of Epsom salt. On no account should pilocarpine be administered in the face of this serious condition, as further œdema and death will probably result.

Vomiting, which is often very troublesome, may be treated by bismuth and iced champagne, but the writer has seen magical results from the administration of sour buttermilk in small quantities. He was led to use it after observing its value in a case where a patient was sinking from intractable vomiting. A constant craving for this acid beverage induced a kind-hearted nurse to give it contrary to orders, and the vomiting immediately stopped. It appeared to act by neutralizing the free ammonia which seemed to be eliminated by the gastric membrane.

Diarrhœa is best let alone, unless very exhausting. It may be overcome by small doses of codeine, and the judicious use of vegetable astringents and mineral acids.

Anæmia, so constantly present, is best met by iron in some form.

Hemorrhage from the kidneys and other regions will require astringents and the hypodermic injection of ergotine. The effects of jaborandi and indian hemp when given by the mouth have been already referred to.

Uræmic dyspnœa is best relieved by drachm doses of sulphuric ether, or by nitrite of amyl, or nitro-glycerin and brisk purgation. The administration of Mexican pulque, the fermented sap of the American agave, has been highly spoken of in chronic Bright's disease, and the writer is making some observations which he trusts to report at a future date upon the effects of this remedy. It appears to act like koumiss, and at the same time stimulates the circulation and brain slightly.

Sleeplessness is best relieved by sulphonal in 20 to 30 grain doses. Opium and morphine sometimes induce serious cerebral disturbance,

and chloral is not to be employed as a routine drug in an affection often associated with cardiac disease and degeneration. Paraldehyde acts safely and effectually.

Headache is relieved by caffeine, antipyrine, and antifebrin.

Hitherto the treatment of the chronic form of Bright's disease, associated with the *large white* kidney, has been discussed. The variety of the affection characterized by the presence of the *fatty kidney* will be treated best upon exactly the same lines, the various symptoms of the diseases in which it is met (chiefly phthisis) being dealt with according to requirements.

The treatment of the *amyloid* or *waxy* form of the disease will resolve itself into the treatment of the *cause* of the affection, and in the early stages of the disease the removal of this may be followed by complete restoration. Thus the source of the prolonged suppuration must, if possible, be removed, and diseased bone extracted. Chronic abscesses may be surgically dealt with, and pulmonary or pleural suppuration, when not depending upon tubercle, may be remedied by appropriate medicines, incisions, and drainage, with change to a warmer climate. Syphilis in its protean tertiary phases may be combated, and the patient placed in a fair way toward recovery if the disease has not lasted too long. Large doses of iodide of potassium and small doses of phosphorus ($\frac{1}{32}$ grain) may be followed with benefit, and iron is always indicated.

As the disease is not generally associated with marked diminution in the total quantity of urea daily excreted, uræmic symptoms will seldom be met with, and the treatment by diaphoretics, diuretics, and purgatives will seldom be required. Dropsy will seldom require much attention, anæmia being the most prominent symptom needing treatment, and the various complications of the original affection upon which the kidney disease depends.

The *cirrhotic* form of Bright's disease will be treated upon much the same lines as the other varieties, but as anasarca and loss of albumin play so small a part in the progress of the disease, treatment in this direction is seldom required. Uræmic symptoms afford the main indication, and in the later stages of the disease the treatment resolves itself into that of uræmia, and though the progress of the affection is always toward a fatal issue when once thoroughly established, nevertheless there are few affections in which the physician can so confidently feel that he can prolong life by the judicious use of remedies to lower arterial tension, and relieve the system from the dangerous accumulation of effete products by acting upon the skin and bowels.

Arsenic and iodides, alone or combined, are supposed to exert some influence over the primary lesion; their action is, however, very uncertain at the best; and if there be any drug whose administration will be followed by some constant action upon the pathological process, or upon the increased growth of the fibrous stroma, it will be found in the chloride of gold, in doses of $\frac{1}{15}$ grain three times a day in a pill.

Arterial tension may be lowered by small and oft-repeated doses of nitro-glycerin, but it is manifest that this treatment cannot be kept up for an indefinite time in the course of a disease of many years' duration, nor is it advisable to lower it too much. Constant purgation with salines every morning, especially with the sulphate of magnesia, Friedrichshall or Hunyadi water, may be kept up with much benefit for very long periods. In the intervals during which purgatives may be suspended and the bowels allowed to rest, nitro-glycerin and nitrites may be given, and hot air-baths or hot packs at night.

It is needless to say that the causes of the disease should be removed, and, at the earliest possible moment, chronic alcoholism, lead poisoning, and gout be actively dealt with.

Upon the first appearance of dangerous uræmic symptoms, the physician should purge rapidly, employ the hot wet-pack, and give pilocarpine by subcutaneous injection, and try the nitrite of amyl or bloodletting.

BROMIDROSIS.

The treatment of fetid perspiration, chiefly of the feet or armpits, but especially of the former, is a matter of importance, as the victims are almost outcasts, owing to the extremely unpleasant odor arising from them. The most scrupulous cleanliness must be rigidly enforced and the general health carefully attended to. Internal remedies have some effect, but though their action is generally unsatisfactory, they should have a trial, always, however, combined with local treatment.

Belladonna or atropine internally has some influence upon the secretion of the sweat, and may be combined with ergot.

℞.—Tinct. belladonnæ ℥j.
Ext. ergotæ fld. ℥j.
Tinct. hyoscyami ℥j.—M.

S.—Take twenty-five drops three times a day in a little water.

20 grains of boric acid three times a day, along with 20 grains of precipitated sulphur, morning and night, may be tried.

The best local treatment by far is powdered boric acid rubbed into the skin and dusted freely between the toes, and generously strewn over the inside of the stockings and boots, and repeated twice a day or oftener, with change of stockings. Cork inside soles should be worn and changed from time to time, or dipped into saturated boric acid solution and allowed to dry. Stockings may be treated in the same way with advantage.

This treatment carefully carried out will, in the great majority of cases, effect a cure if persisted in. Strong boric ointment may be used instead, by those who have long walks to accomplish with very tender feet.

Bardet uses the following powder, sprinkled inside the stocking soles, after washing the feet and rubbing with alcohol:

℞.—Pulv. talcis ʒx.
Bismuthi subnit. ʒxj.
Potassii permang. ʒiij.
Sodii salicyl. ʒss.—M.

Sponging the feet over with the tincture or liniment of belladonna is useful; and Hebra used the diachylon ointment spread upon strips of linen, and applied morning and night—8 ounces of the best olive oil, boiled with 2 ounces of litharge, and made into an ointment.

The application of the induced or continuous current is of use; and 1 drachm of quinine, dissolved in 10 ounces of alcohol, and sponged over the feet, has been followed by removal of the unpleasant symptom.

Weak corrosive sublimate solution has been tried, and solution of salicylate of soda, oxalic acid, naphthol, and boroglyceride have given good results. Unna uses an ointment consisting of equal parts of zinc ointment, turpentine, and ichthyol, and dusts in a powder during the day composed of 15 grains of powdered mustard and 1 ounce of talc.

Where the excessive and unpleasant sweating of the feet is associated with the formation of ulcers and abrasions, the dry boric acid will often effect a cure, but the use of a 5 to 10 per cent. solution of chromic acid as a preventive before ulcers break out, as adopted in the German army for tender feet, is of value. The writer has seen trouble follow the use of this solution in cases where blisters or ulcers had already formed, and several cases of serious poisoning from the absorption of the acid are already reported. As the boric acid meets all requirements, there is little justification for the use of any remedy associated with such risk. If not already given up by the German military authorities, it probably soon will. (See also under Perspiration.)

BRONCHIECTASIS

will be best treated by attention to the general health and the judicious use of remedies indicated in wasting diseases, as cod-liver oil, malt extract, or hypophosphites. Change of climate, sea voyage, and the use of remedies applicable to chronic bronchitis, especially the iodide of potassium.

Creasote holds the first rank as an internal remedy, and is indicated in both forms of the disease, whether the enlargement or dilatation of the bronchi be general, or only confined to one or more saccular or cavernous dilatations. It is in the latter variety that the greatest difficulties in treatment present themselves. The pus or muco-purulent discharge lying in these cavities becomes very fetid, and can only be

reached, in many instances, by remedies eliminated by the bronchial mucous membrane. 2 or 3 minims of creasote, three or four times a day, in mixture or capsule, sometimes gives excellent results, especially when the cavity is basilar. Oil of sandal wood, oil of eucalyptus, carbolic acid and tar, or terebene, or paraldehyde can be given upon the same principle. Myrtol, in capsules containing 2 minims, four times daily, has given excellent results.

Inhalations are indicated, and creasote stands first upon the list. Chlorine, iodine, menthol, eucalyptus, carbolic acid, terebene, thymol or oil of peppermint may be given as an inhalation with hot water, or placed in any of the respirators made for the purpose. It is a good plan to saturate the air of the patient's room with the vapor of turpentine, or of the oleum pini pumilio or oleum krummolzol.

The violent paroxysmal cough, produced by attempts at the clearing out of the cavity, may be relieved by these inhalations; if not, chloroform or ether may be added, or a whiff of either taken alone. Massage may be very useful in assisting the emptying of the cavity.

Where there is a large cavity, especially if near the middle or base of the lung, which cannot be reached by inhalations, and which the patient cannot empty by severe coughing, the propriety of making a free opening from the outside, and establishing thorough drainage, is beyond dispute, especially if the physical signs show that it is near the surface of the lung. The writer has found in several cases that the patient may be made to empty the cavity by lying in bed, and almost inverting his body by bringing his head near to the floor, supporting the weight of his trunk upon his hands, which rest upon the floor. The pus sometimes flows out in a stream from the mouth by assuming this position. Some patients in stooping to tie their boot-laces, discover this plan for themselves. It is a good plan to have a flannel binder, moistened with oil of eucalyptus, placed round the chest and abdomen, the odor of the oil is given off slowly all day, and is inhaled by the patient constantly.

BRONCHITIS, Acute.

The mild cases of acute catarrh, involving only the larger divisions of the bronchial tree, require little treatment. Where the patient persist in going about and attending to his ordinary duties, the physician should be careful not to prescribe the remedies indicated where the affection is more severe, and where the patient is confined to his room. Thus diaphoretic remedies, sprays, and inhalations render the patient more susceptible for the time, and should he expose himself immediately afterward, a mild attack of bronchial catarrh may be converted into one of capillary bronchitis. A hot bath at bedtime, followed by a large mustard poultice and one dose of morphine, ¼ grain, upon lying down will give relief during the night, and sometimes will cut short the attack. For administration during the day, 5 minims of liquor mor-

phiæ (grains iv to f℥j) and 10 minims of vin. ipecac., may be given every few hours. Where the attack, though limited to the larger bronchi, is much more severe, and is ushered in by some feverishness and dry harassing cough, with sense of constriction and rawness in the chest, the patient must be confined to his bed or his room, which should be kept at an even temperature a little over 60° F.

The air should be rendered moist by the vapor of hot water. For this purpose the ordinary bronchitis kettle placed upon the fire is best, or a few feet of tin tubing attached to the spout of the kettle will do. The numerous spirit-lamp contrivances so much used should be strongly condemned. The unwholesome products of combustion escaping into the confined air of the room aggravate the cough, and add to the bronchial irritation. It is not an unusual event to find the cough cease when they are discontinued. Plenty of warm drinks should be administered, and there is nothing more grateful than home-made lemonade mixed (just before being swallowed) with kali water, the resulting citrate of potash formed by the combination being one of the most valuable of diaphoretics and expectorants, or the following mixture may be prescribed:

℞.—Potas. bicarb. ℥j.
Tinct. aconit. ♏viij.
Aquæ ℥xij.—M.

S.—Take two tablespoonfuls, with a tablespoonful of fresh lemon juice, every four hours.

At this stage the chief indication is to combat the dry, swollen, and congested condition of the bronchial tubes, or, as Sir Andrew Clarke puts it, "to cause the tubes to sweat," and there is no remedy equal to small and repeated doses of tartar emetic. These may be administered after the first twenty-four hours, and are combined with morphine to great advantage thus:

℞.—Antim. et potass. tart. gr. j.
Morph. acet. gr. jss.
Vini ipecac. ℥ij.
Aquæ camph. ad ℥vj.—M.

S.—A tablespoonful to be taken every three hours.

A large poultice of linseed and mustard should be applied to the front of the chest to cause thorough redness of the skin, and when it becomes so irritating that it can no longer be borne with comfort, it should be replaced by a layer of warm cotton wool, and another poultice of the same kind applied to the back of the chest. Where there is much dyspnœa, the poulticing may be continued throughout by applying plain linseed poultices every two or three hours after the linseed and mustard have caused redness.

In the case of children the same treatment may be carried out, only morphine or opiates should not be given. The little patient will, however, bear almost as large a dose of antimony and ipecac as an adult. For a child two years old the following may be given in teaspoonful doses every two hours:

℞.—Vini antim. ℥j
Vini ipecac. ℥ij.
Liq. ammon. acet. ℥iv.
Syr. tolu. ℥iv.
Aquæ ad ℥ij.—M.

The action of the expectorant is assisted by a hot bath beforehand. A smart purge is of use, and in gouty subjects affords marked relief. A teaspoonful of Rochelle salt for children, preceded by 1 or 2 grains of gray powder; and in adults a 5 grain blue pill, followed by a couple of wineglassfuls of Friedrichshall water, may be given.

Under this treatment the harassing dry cough gives place to a moist, easy, and loose expectoration, after which the antimony may be discontinued, and the following administered in teaspoonful doses after meals:

℞.—Potas. iodidi. ℥j.
Vini ipecac. ℥iij.
Spt. chlorof. ℥ij.
Inf. senegæ ad ℥iv.—M.

S.—To be used as directed.

Or,

℞.—Ammon. carb. ℥j.
Spt. ammon. arom. ℥iv.
Aquæ cinnamom. ad ℥vj.—M.

This may be given in doses of a tablespoonful, with water, every four hours.

Ammonia may also be given in the first stage of the affection with advantage, if there be any indication for a stimulant. Should the cough appear to be out of proportion to the amount of expectoration present, it can be allayed with anodynes, but no greater mistake can be made by the physician than simply to order morphine or chloral to quiet cough when the tubes are filled with secretion. In young and also in aged patients this practice will be followed by fatal results. It checks the expectoration, and renders it more tenacious; at the same time sensibility being diminished, the cough does not occur, and the secretion gathers in the tubes.

Where the inflammation of the bronchial tubes has extended as far as their finest divisions, the physician will find himself face to face with a very grave malady. Here, in addition to warmth in bed and

steam inhalations and poultices, morphine must be most cautiously exhibited, if given at all, and in the old or very young it must be withheld altogether.

As in the milder form, antimony should be given at once and in larger doses, and it should be combined from the beginning with ammonia, and given every two hours till the dry and swollen condition of the tubes is remedied.

℞.—Vin. antim. ℥iv.
Spt. ammon. aromat. ℥j.
Spt. chlorof. ℥ij.
Aquæ ammon. acet. ℥ij.
Aquæ ad ℥viij.—M.

S.—Take a tablespoonful every two hours.

Tinctures of belladonna and benzoin comp. in equal quantities (℥j to ℥ij) may be inhaled every few hours with the vapor of boiling water. Succus conii may be similary employed. The B. P. extract is useless. Should there be much pulmonary engorgement, bloodletting may be called for, though this will be seldom. Leeching is useless; but relief will be obtained by dry cupping over the front and back of the chest, and sometimes a cantharides blister will be called for.

Apomorphine is a drug of great power, and, pushed to the verge of vomiting, it speedily causes abundant secretion of thin expectoration. By the mouth it can often be taken in doses up to ½ or 1 grain without causing vomiting, as pointed out by Murrell. Should relief to the breathing and cough not be obtained by these measures, vomiting should be established by the use of a nauseating expectorant. Two drachm doses of vin. ipecac., ½ grain of apomorphine, or 1 grain of tartarized antimony should be given, followed by copious warm drinks till vomiting supervene: $\frac{1}{10}$ grain of apomorphine will be certain to cause profuse vomiting in strong adults, if given hypodermically, in five to ten minutes or less. Half this dose is sometimes sufficient.

The treatment by emetics, seldom required in adults, must be a part of the management in every case of severe capillary bronchitis in children, and the physician should see that vomiting occurs twice a day or oftener, vin. ipecac. being the best remedy. The act of vomiting in young children is not followed by the depression observed in adults, but it should never be allowed to cause serious prostration. Young children should be wakened up occasionally, and caused to cough or vomit to prevent accumulation of mucus in the tubes.

Alcohol or wine whey should be administered in proportion to the debility present, and alcohol given in warm drinks is a valuable expectorant at this stage, and is absolutely necessary in acute bronchitis in the aged and in very young and delicate children.

Inhalations of compressed air and oxygen, saturated with warm moisture, have been successfully employed; and the writer, in 1874

treated a patient by inhalations of ozone. Oertel recommends the inhalation of cold air.

In acute bronchitis in patients suffering from valvular lesions, digitalis in full doses, combined with ammonia or ether, is indicated.

℞.—Tinct. digitalis ℥ij.
Spt. ammon. aromat. ℥j.
Spt. ætheris ℥iv.
Spt. chlorof. ℥ij.—M.

S.—A teaspoonful in a small wineglassful of water every three hours.

Tincture of lobelia—a dangerous remedy in the weak, or in those suffering from heart troubles—may be given in 30 minim doses if there is much bronchial spasm.

Turpentine, in 30 minim doses, is a powerful expectorant and stimulant in cases where the depression, caused by antimony and ipecac, is an element of danger.

Pilocarpine often increases the expectoration rapidly, but it must be given with caution.

Bryonia, actæa racemosa, sanguinaria, muscarine, and many other drugs are recommended as expectorants in the early stages of acute bronchitis. It is wiser for the young physician to select the older remedies: Tartar emetic, ammonia, ipecac, etc., whose values are established by long experience. By closely watching the effects of these agents, he will soon find that by varying the dosage and intervals between the doses, that he can accomplish almost anything with any one of them.

After a few days the expectoration will become "loose" and more abundant. It will now be wise to stop the tartar emetic, and give a little ipecac and squill with ammonia.

℞.—Vin. ipecac. ℥iv.
Tinct. scillæ ℥iv.
Spt. ammon. aromat. ℥vj.
Syr. tolu. ad ℥iij.—M.

S.—Take a teaspoonful four times a day in water.

Apomorphine in small doses, $\frac{1}{12}$ grain, may be continued all through the attack with advantage.

Iodide of potassium, at a later stage, is the best drug we possess, and chloride of ammonia may be combined with it in senega infusion.

The diet should be of the most sustaining kind. Milk and whiskey, with strong soups, beef-tea, Valentine's beef-juice, and Brand's essence, given in small doses at very short intervals, oysters, fish, and farinaceous foods. Everything that interferes with the free play of the diaphragm must be watched, and flatulence and constipation corrected. Sleep may be urgently needed, but opium and morphine should not

be given. Chloral, in small doses, often soothes cough and promotes sleep, but its effects upon the heart must be watched. Paraldehyde (1 drachm) or sulphonal (30 grains) will be valuable, but the patient should not be allowed to sleep long at once.

In children collapse of the lung, as evidenced by signs rnd symptoms, must be met by vigorous treatment till the shallow breathing, lividity, and drowsiness pass off. The patient should be plunged into a bath of hot water, to which mustard has been added, and afterward treated by a dash of cold water till free and deep respiratory movements take place.

Artificial respiration may be kept up, and a weak, interrupted current, if at hand, will do good. Afterward free stimulation with ammonia, and small doses of brandy, with smart sinapisms to the chest-wall, and a limited allowance of sleep at one time, will be the best means to meet the collapse.

Quinine, so much recommended in acute bronchitis, and even in the serious complication just mentioned, is, according to the experience of the writer, a mistake. He has frequently seen marked embarrassment caused by the action of one large dose in drying up the expectoration and rendering it adhesive and difficult to be expelled. Musk may be given with advantage in such cases.

Professor Gairdner has philosophically worked out the complex problem of the action of expectorant remedies, and has arrived at the conclusion that expectoration is far more dependent upon the expulsive mechanism of the muscular fibres than upon alterations in the amount of consistency of the secretion. To these muscles he gives the name of "scavenger muscles" of the respiratory tract, as they perform for the lungs and bronchi the same service as the intestinal peristalsis in the case of the digestive tract. He therefore urges that in the treatment of bronchitis, the so-called expectorants should be prescribed as excitors of the bronchial peristalsis, in the same sense as cathartics are excitors of the intestinal peristalsis, or as ergot is an excitor of the uterine action. This action is, in his opinion, to a great extent independent of vomiting, and also even independent of change in the density and adhesiveness of the expectoration, and that all the necessary effects of carefully regulated doses of squill, ipecacuanha, or tartar emetic may be obtained without observing any appreciable general increase of the excretion, such as is presumed to take place by those who hold that increase in quantity of the bronchial secretion is the primary cause of the therapeutic action of expectorants. For the views of the writer and the important experiments of Rossbach, the reader is referred to the fifth edition of *Pharmacy, Materia Medica, and Therapeutics*, page 363.

BRONCHITIS, Chronic.

Treat the cause, if possible. Thus, if dependent upon the inhalation of foreign particles, the patient must change his environment, and any occupations necessitating the breathing of a dusty atmosphere. If the

patient's means permit, removal to a warmer and drier climate is necessary. If gout be the cause (this is frequently so in *dry* catarrhs), this malady will require careful attention. Should the chronic catarrh be caused by long standing congestion of the bronchial mucous membrane, the result of valvular lesion or cardiac failure, much can be done by strengthening the heart and improving the circulation. In those cases where faulty elimination of effete matters by the kidney appear to aggravate bronchial trouble, the treatment for chronic uræmia will give relief. The presence of emphysema will be an indication for tonics and measures directed to the maintenance of the general health. The physician endeavors, when the case is not of very long standing, to act upon the bronchial mucous membrane, so as to modify or alter the diseased action.

Iodide of potassium, arsenic, and iron, alone or combined, are very useful for this purpose, and there is the further advantage in employing iodide of potassium that it is one of the best expectorants, rendering the sputum more liquid and remedying its tenacious or adhesive quality, and it is the best drug for bronchitis associated with difficulty of breathing or asthma. Various methods of employing inhalations of compressed air have been employed, and Waldenburg has obtained excellent results by means of a gasometer, with a tube containing a valve and ending in a mask for the mouth and nose. The patient is recommended to *inspire* for ten to fifteen minutes, three times a day, air under a slight pressure. The valve or stopcock is then reversed, and, by the adjustment of weights, the air is rarified and the patient by *expiring* into this rarified air for a few minutes, counteracts any distention of the air-cells or alveoli, and materially benefits any pulmonary emphysema present.

Various forms of pneumonic chambers are in use on the Continent, and the patient on entering can either inspire compressed air or expire compressed air into rarified air.

Should the cough be dry and the efforts at expectoration difficult, the physician will have to satisfy himself, by close examination of the symptoms, whether the patient is not coughing much more than is really necessary to get up the expectoration. This is a point of vital importance in the treatment of chronic bronchitis. Upon the decision arrived at will depend the administration or prohibition of sedative remedies. By checking cough, much good will be done if this cough can be seen to be useless, but if by checking cough, expectoration accumulates in the tubes, much harm may result. Morphine or opiates should, therefore, in the chronic as in the acute disease, be administered with great caution, and if the physician is in doubt he should order only small doses to be suspended if lividity or drowsiness appear, and by prescribing a stimulating expectorant along with the sedative, the minimum of risk is encountered.

Given, then, a case of dry catarrh, with much difficult cough and

little expectoration of a thick adhesive kind, the best treatment will be a mixture like the following:

℞.—Potas. iod. gr. xxxv.
Potas. bicarb. ʒiv.
Ammon. chlor. ʒij.
Morph. hydrochlor. gr. jss.
Aq. cinnamom. ad ℥viij.—M.

S.—A tablespoonful every four or six hours, or a teaspoonful every two hours.

Or,

℞.—Apomorph. hydrochlor. gr. ij.
Codeinæ gr. iij.
Vini ipecac. ʒvj.
Glycerini et aquæ ad ℥iij.—M.

S.—Take a teaspoonful every three hours.

Alkaline salts have the power of diminishing the viscidity of the expectoration, and hence the value of various mineral waters. Where from any cause there is fever present, as in bronchial attacks in phthisical patients, there is no combination gives such relief as a solution of bicarbonate of potash in effervescence with lemon juice, the citrate of potash being a valuable expectorant. $\frac{1}{25}$ grain of morphine may be added to each dose. (See formula upon page 83.)

In cases of chronic bronchitis associated with profuse purulent or muco-purulent expectoration, morphine or other sedatives are not to be administered, for, as pointed out by Burney Yeo, remedies are indicated which have a specific action upon the inflamed membrane, and to this important class belong all the volatile expectorants and those containing some active ingredient excreted by the bronchial surface: ammonia, ammoniacum, asafœtida, balsams of Peru and tolu, copaiba, creasote, guaiacol, getroleum, cubebs, eucalyptus, sulphur, garlic, tar, terebene, turpentine, myrtol, camphor, terpin hydrate, terpinol, oil of sandal wood, and many others.

It is impossible to enumerate the special indications for each particular expectorant; unfortunately, we do not know the class of case in which some will fail and others will succeed until we try, and occasionally the physician will find himself combining several in one prescription—mitrailleuse-like.

Tar is about the best member of the group. It may be given in capsules, pills, or mixture, emulsified with suitable excipient, but tar-water (1 : 10) taken in wineglassful to half-pint doses, is the least elegant, but most efficatious, preparation. Ringer and Murrell found 2 grain pills every three or four hours most efficacious in winter cough and bronchitis with profuse expectoration. Yeo advises inhalations of tar by forming a spray of the water by means of a Seigle's spray pro-

ducer, and he adds 10 per cent. of carbonate of soda to good ship's tar, to neutralize the irritating pyroligneous acid, and boils the mixture on a plate over a spirit lamp in the patient's room for fifteen minutes once or twice a day.

Creasote may be given in capsules, and the internal administration supplemented by inhalations, fumigations, or sprays. It is the best remedy where there is any trace of fetor in the expectoration. Lantier gives small capsules containing the essence of pinus pumilio.

For the chronic bronchitis of the aged, ammoniacum is a most valuable expectorant. It relieves wheezing and promotes expectoration, and the writer obtained splendid results in a large infirmary of aged invalids with the following inelegant stock mixture:

℞.—Ammon. chlor.		℥j.
Aquæ ammoniæ		℥j.
Spt. camphoræ		ʒiij.
Mist. ammoniaci	 ad	℥xx.—M.

S.—Take a tablespoonful four times a day in water, the bottle being well shaken.

Terebene, in doses of 10 to 15 minims in capsule or upon sugar, is a good remedy in winter cough and in brochitis with emphysema. It may be used as an inhalation.

Squill, senega, ipecacuanha, actæa, lobelia, serpentaria, checken, grindelia, hydrastis, physostigma, sanguinaria, stramonium, hyoscyamus, and belladonna have been all tried with success from time to time in the treatment of chronic bronchitis. Most of them have already been referred to under acute bronchitis. The favorite remedy in the chronic and subacute attacks of bronchitis in childhood, and the most convenient and safest, is a mixture of equal parts of wine of ipecac and syrup of squill. For a child one to two years old, 10 to 15 drops every three hours, and as an emetic, 1 teaspoonful. There is perhaps no combination or mixture so universally used as the following in chronic bronchitis with emphysema. Patients stick to it for years after discarding all others. Perhaps it owes its virtue chiefly to the ammonia contained in it. Harris states that of all the drugs which he has employed, he gives the preference to the carbonate of ammonia in chronic bronchitis.

℞.—Ammon. carb.		℈iv.
Tinct. opii camph.		ʒvj.
Syr. senegæ		ʒiv.
Infus. senegæ	 ad	℥viij.—M.

S.—Take a tablespoonful four times a day in a little water.

Strychnine, by stimulating the respiratory centre, becomes a valuable expectorant. It may act also according to Gairdner's theory, by stimulating the "scavenger" muscles and increasing the activity of

the expulsive mechanism in the bronchi. It may be combined with belladonna with great advantage where there is much secretion and weakened expulsive powers.

Though the list of expectorants contains more than one hundred remedies of undoubted value, the physician will find that most of the cases of chronic bronchial trouble can be well combated by one or more of the following list, beyond which the writer seldom finds it necessary to travel: Apomorphine, alkalies, ammonia, tar, ipecac, creasote, potas. iod., and senega, and perhaps the greatest of all these is apomorphine.

Cocillana has recently been used as a substitute for ipecacuanha, in doses of 5 to 8 minims of the fluid extract.

For chronic bronchitis with *exceedingly* profuse discharge, *i. e.*, cases of bronchorrhœa, an occasional emetic and full doses of a mixture of ammoniacum, ammonia, and senega afford the best treatment. Opium or sedatives are fatal if given in even fair doses.

Reference has already been made to the use of sprays and inhalations in chronic bronchitis. As a rule, it may be said that too much reliance should not be placed upon their use, and many maintain that they are useless. Ringer and Murrell have obtained excellent results from a spray of vin. ipecac. in winter cough. This spray is used by atomizing the ordinary vin. ipecac. with a Richardson's apparatus or with a steam atomizer; generally the wine does best diluted with an equal bulk or more of water. About two drachms of the wine are sufficient for each sitting, and after a few trials the patient succeeds in taking it in deeply.

Lobelia, antimonial wine, and iodide of potassium, 2 per cent. solution, have all given excellent results in chronic winter cough in the hands of Murrell.

"Spirone" is stated to be a solution of iodide of potassium in glycerin and acetone. Harris, in a very able paper recently, mentions this latter fact, and states that terebene, pinol, and chloride of ammonium have been used as sprays with success.

Chloride of ammonium, inhaled from a "chloride of ammonium inhaler," is of undoubted value, especially in cases of chronic catarrh of the trachea, larynx, and larger bronchi.

Eucalyptus, carbolic acid, creasote, and most of the volatile expectorants and antiseptics, are of value when administered as inhalations, especially where there is marked fetor or decomposition of the bronchial secretion.

Any of the volatile drugs can be used as an inhalation, by simply adding them to boiling water and then inhaling their vapor in combination with the steam given off by the water. Friar's balsam or the compound tincture of benzoin, is the most frequently employed.

The writer has had great satisfaction with turpentine. By saturating the air of the room with it, much good can be done in chronic bronchitis, and if hemorrhage be present there is no remedy equal to it.

It can be poured upon the surface of boiling water in large open vessels, placed about the patient's bed.

The antiseptic volatile expectorants may be placed in a respirator and worn for hours during the day. The following is a good formula: Thymol, half a part; carbolic acid and creasote, of each one part; spirit of chloroform, four parts. Dr. Baner has recently reported good results from using a spray of liquefied vaseline in both acute and chronic bronchitis.

The oleum pini pumilio is an agreeable and efficient alterative and expectorant when inhaled.

Counter irritation is of value in chronic bronchitis, and it may be accomplished by iodine, acetic acid, croton oil, capsicum, mustard, tartar emetic ointment, or any other irritant, but, as a rule, the volatile expectorants, which are also revulsives, are much superior. Thus the lin. tereb., or lin. tereb. acet., or Stokes's favorite application, of which the following is a modified formula, may be employed:

℞.—Olei tereb. ℥iij.
Acid acetici ʒxij.
Ovi vitellum j.
Olei limonis ʒj.
Aquæ rosæ ad ℥vj.—M.

Or, the oil of eucalyptus with camphor may be tried.

The value of these applications lies (1) in their revulsive action; (2) the friction assists the expulsive efforts, and dislodges collections of mucus; (3) the vapor clings to the skin and clothes of the patient, and is gradually inhaled; and (4) a minute trace also is absorbed through the unbroken skin, and reaches the pulmonary tract through the blood.

Massage, or manual compression of the chest and abdomen in expiration, recommended by Gerhardt, is useful where, owing to bronchial dilatations, or cavities, or weakness in the expiratory apparatus or mechanism, accumulations of secretion are liable to occur.

Where the patient's means afford it, there will crop up the question of a suitable winter residence, and a sojourn at any of the Continental Spas, where the free use of alkaline waters may be tried, as at Braum, Soden, Ems, Mount Doré, etc., or any place at home where natural sulphur water may be had. If the patient finds that a warm, dry air suits his breathing, he may go to Mentone or San Remo, or if a still drier atmosphere is desired, Egypt or the Nile, Algiers or Tangiers will be best. Should, however, a soft or sedative air be desired, Madeira, Pau or Torquay, Penzance, Bournemouth, or Isle of Wight may be recommended.

Bronchial irritation in young subjects where the supervention of tubercular phthisis is feared, will be well treated by a prolonged resi-

dence at the pine forests of Arcachon, or at Bournemouth, nearer home.

BRUISES.

If seen early before discoloration has already occurred, may be best treated by the application of cold. Ice or evaporating spirit lotion is the most effectual. A cold saturated, recently prepared solution of chloride of ammonium is a good application to orbital contusions where a "black eye" is dreaded. The juice of the fresh root of convallaria (Solomon's seal) is reputed to be of great value for the same purpose. Arnica, so much recommended for this purpose, should be used with extreme caution. It is of little or no value, and often produces dangerous erythematous rashes, which may spread from the site of application over the entire body.

Should extravasation of blood or ecchymosis already have taken place, warm spirit lotion, covered with oiled silk, and padded over with thick layers of cotton wool, and bandaged moderately tightly, will do more than anything else to cause absorption of blood. Capsicum, camphor, and mild counter-irritants may be afterward used to hasten the process. Pain is best relieved by opium, aconite, belladonna, or acetate of lead.

The application of leeches occasionally prevents discoloration, if used very early.

BUBO.

Confining the term to an indurated and often suppurative condition of the glands in the groin, secondary to a venereal sore on the penis, the first treatment should be directed to the sore itself, and all irritation or inflammation in it should be at once attended to. If the bubo is only in the early stage, it may be prevented from suppurating by freely painting the skin over it with very strong solution of nitrate of silver, or by moistening the skin and rubbing with the solid nitrate.

Saturated solution of iodine, in spirit, may be used. The writer has obtained excellent results by painting the skin over the enlarged gland with iodized phenol (iodine, 1 ounce; carbolic acid, 4 ounces).

Ice or evaporating lotions may be applied and rest enforced. The heroic method of injecting carbolic acid or of applying blisters, followed by iodine, is not to be advocated. The state of the patient's general health should be narrowly examined, and tonics, aperients, and liberal diet, with a change to the sea air, if possible, in bad cases, may be necessary. Should the swelling have lasted too long and there be pain and redness, a good linseed poultice should be applied. But if the hope of preventing suppuration is not altogether out of question, the physician should not hesitate to apply a poultice; sometimes by relieving tension it saves the part from suppuration. If matter has already formed in the gland, it will be obvious that a few poultices,

followed by a free incision, is the best treatment, and if there has been much sloughing of the surrounding tissues, and a great enlargement of the glands, they ought to be excised.

The sore resulting from ulceration or incision may be swabbed out with corrosive sublimate solution (1 : 500) or iodized phenol, and dressed with spirit, lead, carbolic or chlorate lotion, or dusted over with iodoform.

Should healing be very slow or indolent, a light brush over with nitric acid or acid nitrate of mercury, and after-dressings of solution of chloral (1 : 30) or peroxide of hydrogen will hasten recovery. In very chronic cases the agents detailed under Ulcer may be used after failure of the above, but in most chronic cases there is no drug so uniformly successful as iodoform. It may be dusted over the sore or used as an ointment (1 drachm to 1 ounce).

BUNION.

The only treatment followed by lasting benefit is to remove the cause, by insisting upon a wide-soled boot, with square, roomy toes and low, broad heels. The deformed large toe is to be drawn inward into line with the inner border of the foot, maintained in this position with strapping, or with Sayre's buckskin glove, into which the toes fit, and which is kept in position by a piece of India-rubber webbing fastened to the heel with plaster.

Instrument makers supply a bunion spring, but it is not comfortable. The writer has had good results with a simple piece of leather moulded when wet to the great toe, as it is held in position in line with the inner border of the foot. This is fastened on in the evening and worn until the next morning.

Liniment of iodine applied daily reduces induration and relieves pain. Should inflammation have supervened, rest must be enforced and the swollen joint treated with evaporating lotion (lead and opium or spirit), and if suppuration occurs, a free incision. Relief in slight cases may be obtained by wearing a neatly fitting felt plaster with a hole cut in its centre.

Another method of treating bunions is given in Sajous's *Annual*. The foot is well washed and dried, after which the healthy skin surrounding the bunion is then coated over with a layer of flexile collodion for protection. Carbolic acid in the crystalline form is then thickly laid on over the bunion, and the superfluous acid removed by blotting paper. The applications are made every three or four days. This can only be of use in very mild cases.

Where ordinary measures fail, and the deformity causes both pain and inconvenience, various surgical procedures may be tried. These have been recently reviewed by Fowler, who condemns the plan of cutting the tendon of the extensor proprius pollicis, with or without section of the external lateral ligament of the joint. Unless where suppuration and caries have supervened, subperiosteal resection of the

head of the metatarsal bone is not a justifiable procedure, as it shortens the inner margin of the foot unnecessarily.

Cuneiform osteotomy does not give satisfactory results, and partial resections or removals of the outgrowths have generally failed, owing to the nature of the tissues forming the margins of the skin wound which is made upon the inner aspect of the joint, and owing also to the exposed situation of the cicatrix. Hunter, by utilizing Petersen's incision for tubercular disease, has overcome all these difficulties. He attacks the diseased spot by an incision along the *outer* side of the metatarsal bone, dividing all the structures between the dorsum and sole of the foot, between the first and second metatarsal bones, and then opens the joint, after strongly adducting the great toe. The head of the bone can then be easily removed, when it is the site of the usual exostosis. The after-treatment is conducted upon general surgical principles, care being taken to provide efficient drainage, and, after the healing process is completed, a partitioned shoe and glove-stocking afford great comfort.

BURNS AND SCALDS.

When the skin has been for a short time submitted to even an intense heat, if a saturated solution of bicarbonate of soda be instantly applied, no vesication or destruction of cuticle occurs, and pain is almost instantly relieved. In this simple way, what would otherwise have been a troublesome and painful burn, will be effectually prevented. But the application must be made without delay, and before the cuticle is raised, and the quickest way is to apply the dry salt made into a paste with a little water, and gently rubbed over the smarting spot for a few minutes, adding a few drops of water from time to time. The first treatment required in the case of severe and extensive burns is to relieve the shock and collapse by enveloping the patient in flannel or wadding, and administering liberal doses of hot stimulants—whiskey punch or wine whey—relieving pain by full doses of laudanum, and whilst this is being done, only very limited attention can be bestowed upon the burn itself. The clothing should be carefully cut off, piecemeal, and only a limited portion of the surface of the body should be exposed at one time.

Corrosive liquids, if they have been the cause of the burn or scald, should be washed off with an appropriate solvent. Thus, scalds by boiling acids should be lightly washed with warm water or weak alkaline solutions, and boiling tar scalds can be gently cleaned with any warm bland oil or lard.

Immersion of the body in cold water after *extensive* burns is a very questionable proceeding, and many deaths have been caused in this way; but a burn in the first degree, affecting a limited area of the body—say one limb—may be well treated by immediately enveloping the limb in cold water dressings. Where a very large surface of the

body is burned, and the patient is suffering great pain, relief may be obtained by immersing the patient in a bath at about 98° F.

In dealing with a burn of the first or second degree, whether large or small, the first indication is to exclude the air as soon as possible; if blebs have formed, they should be punctured at their most dependent parts through a small aperture—thus saving as much as possible of the cuticle as a covering to the injured skin. One method is to dust over the entire part with a thick coating of wheaten flour, upon the top of which is placed a soft uniform layer of cotton wool, covered by bandages.

Should this plan be adopted, the writer would suggest that the flour be mixed with some finely powdered boric acid, say 1 to 4. The practice of Ostermayer is an improvement. He uses a powder of potassium sozoiodol mixed with starch or talc-powder in 10 per cent. strength. It has the advantages over most other applications in being without odor and non-poisonous, and it prevents suppuratien.

Powdered iodoform is used in the same way, but it lacks these properties; it is, however, a local sedative.

Salol, thiol, bismuth, and other powders have been used alone, or with talc or oxide of zinc.

Whatever will enable the first dressing to remain on for the longest possible period with safety is an advantage, and these bland antiseptics will delay putrefaction.

The list of dressings and applications for burns is practically endless. Nearly every surgeon has his own favorite; by far the most frequently used is the old-fashioned carron oil, or some modification of it. It is, after all, the best routine treatment for burns and scalds. When house-surgeon to a large hospital for two years, the writer treated all burns admitted by covering them up as soon as possible with broad bands of lint soaked in the following: Lime-water and olive oil, of each one gallon; pure carbolic acid, 6 ounces; and he has never seen a better application. The carbolic acid delays the date of the change in the first and subsequent dressings.

Illingworth recommends a dressing which probably will prove superior to this old-fashioned and tried agent. It is a modification of it, and consists of equal parts of saturated solution of borax and linseed oil. The writer has not yet had an opportunity of using it.

Upon each change of dressing, if suppuration has occurred, the surface should be syringed with a weak antiseptic (boroglyceride, 2 ounces; water, 20 ounces).

Burns of the third degree may be treated in the same way. Hebra's method was to keep the patient in a warm bath for weeks.

The pain is somewhat relieved by the carbolic acid, iodoform, or salol mentioned in the above dressings, but when it is intense there is no remedy equal to cocaine, and it may be applied in solution from 2 per cent. where a very large surface of the body is involved, to 5 per

cent. or more in less extensive burns. It is of little use unless when the cuticle has been removed.

The free use of strong antiseptic applications may retard the separation of the sloughs, and it is especially desirable that this should not be, hence hot applications are indicated. These may be applied whilst the dressings are being changed, which must be often, by immersing the limb in a hot antiseptic lotion, carbolic (1 : 40), boroglyceride (1 : 20), corrosive sublimate (1 : 5000), for periods varying from ten minutes to two hours.

After separation of dead tissues, the granulating wound may be treated upon general surgical principles.

Much care and attention must be given to the position of deep burns, so as to counteract the tendency to future deformity after cicatrization.

The following are a few of the many other methods by which burns may be successfully treated.

By enveloping the part in successive layers of gauze prepared by previously soaking muslin, freed from fatty matters, in an ethereal solution of iodoform, and allowing the ether to evaporate. This appears to be a most excellent plan, and has given very satisfactory results in the hands of Mosetig, who has never seen any bad symptoms follow. The free dusting with powdered iodoform of large tracts of the surface of the body involved in burns or scalds is dangerous.

Oxide of zinc, or powered starch, may be dusted over burns instead of flour, and any harmless antiseptic may be combined with them.

Of greasy applications there is no end. Chalk or whiting made into a paste with boiled linseed oil, calamine and zinc ointments made thin by adding olive oil, boric ointment, white lead paint, iodoform ointment (1 : 30 vaseline), carbolic oil (1 : 20), carbonate of zinc ointment (1 : 10 spermaceti ointment), resin ointment, chalk, olive oil, and vinegar in equal parts, cod-liver oil, kentish ointment (lin. tereb. U.S.P. resin ointment and turpentine). It is a good way to treat small superficial burns by applying turpentine as soon as possible upon lint; though the pain is at first increased, it soon subsides.

Salicylic oil (1 part acid to 60 olive oil).

Olive oil and egg yolk, equal parts; compound elemi ointment (B.P.) olive oil, and thymol (1 : 100).

Of liquid applications for burns any antiseptic lotion may be used such as might be applied to ordinary wounds. (See under Abscess.) Solution of potas. permang. (1 : 500) is a good remedy in the early stage, and solution of cocaine (1 : 50) may be painted on to relieve acute pain.

Of pastes the best are subcarbonate of bismuth and glycerin, oxide of zince and glycerin; or powdered gum arabic, 3 parts; tragacanth, 1 part; molasses, 2 parts; carbolic acid lotion, q. s.

BURSITIS.

In acute affections following injuries and wounds, absolute rest of the limb on a padded splint, and the application of cold lotions or ice generally suffice to bring about resolution. If much pain be present, poultices smeared with extract of belladonna, or hot fomentations may be applied; and if suppuration occur, a free incision and subsequent syringing with very weak sublimate solution (1 : 5000) will be necessary.

For the chronic affection most common in the bursa over the patella (housemaid's knee), the majority of cases yield to the daily application of strong iodine liniment, applied freely (as each layer is allowed to dry it may be followed by a fresh one), so that blistering occurs.

Should this fail, the fluid may be aspirated, and if it soon collect again, a splint and tight bandage may be applied after a second aspiration. Should the fluid again collect, a few drops of strong carbolic acid may be injected, or the fluid once more removed, and a small syringeful of tincture of iodine and water (1 : 2) may be injected and allowed to remain in for a few minutes.

A seton may be passed through the bursa, and allowed to remain. Melon-seed bodies should be removed by small incisions, and the bursa flushed with weak sublimate solution.

Chronic enlargement of the bursa, with fibroid thickening of its walls, can only be successfully treated by excision of the entire mass.

CALCULI, Biliary—See Gall-stones.

CALCULI, Renal—See Stone in the Kidney.

CALCULI, Vesical—See Stone in the Bladder.

CANCER.

The treatment of the various forms of malignant disease by internal medication must be confined to the relief of pain, or to the amelioration of symptoms caused by the disease interfering with the functions of the organs affected.

The administration of Chian turpentine has not been followed by any success warranting further trial, and the same may be said of thuja, and in our present ignorance of the etiology of the malady, there is no internal remedy which can be said to have any effect upon the progress of the disease.

All that we can say at present is, that early removal of the growth and surrounding tissues and lymphatics affords the only hope of cure, and though there are many who believe that operative interference or extirpation will after all but postpone the fatal issue, still there is abundant evidence that early and complete eradication of superficial malignant growths have been sometimes followed by immunity from any return of the disease, and when the disease has returned, it is

generally after such an interval as shows that its progress has been at least retarded.

Extirpation by the knife, though it affords the best hopes, should not be solely relied upon, for one reason. There cannot be a doubt that the earlier the removal the better the prospects, and patients too often cannot be induced to submit to a cutting operation, even by the most urgent and earnest entreaties. In these cases radical application of arsenic, Vienna paste, chloride of zinc, caustic potash, pure bromine, papain, acid nitrate of mercury, or the thermo- or electro-cautery may give better results at a *very early* stage than can be obtained by the knife at a later period. The writer has seen this proved upon several occasions, where patients, refusing firmly to submit to a cutting operation, have submitted to cauterization by arsenic at the hands of quacks with enviable results. The injection of acetic acid, nitrate of silver solution, carbolic acid, and solution of papain or pepsin into malignant tumors has led to no practical benefit.

Mosetig-Moorhof's plan of injecting about a drachm of a solution of methyl-violet (1 : 500) is attracting deep interest.

Cancer of the Bladder.—Removal of malignant tumors of the bladder should seldom, if ever, be attempted. Relief of pain by morphine, by the mouth, anus, subcutaneously, or by injection into the bladder, should be tried, and cocaine suppositories sometimes afford great relief, and injections of conium, chloral, and other sedatives occasionally give some ease. Failing this, however, a free perineal opening into the bladder, establishing thorough drainage, may give highly valued freedom from the agonizing attempts to micturate, and may enable the patient to pass the remainder of his short life in comparative peace.

Cancer of the Breast.—The earliest possible removal of the whole gland, with exploration of the axilla and extirpation of every lymphatic gland to be seen or felt, is the only line of practice followed by satisfactory results.

Heidenhain has made some remarkable observations, which emphasize the great importance of removing every vestige of the disease. He investigated histologically eighteen cases of primary cancer of the mammary gland. In all the cases in which there had been a recurrence, he was able to make out by microscopic examination that fragments of cancer had remained in the wound after the operation. The extension of the disease from the tumor to the surrounding tissues is invisible to the naked eye, and where he found no epithelial rays extending from the tumor to the margins of the tissues removed along with it, no return of the disease occurred. He often found that these extensions invaded the muscular aponeurosis of the pectoralis. Hence he insists upon the necessity of taking away the aponeurosis and cutting into the healthy muscle in every case where the tumor is adherent.

Gross also puts this forcibly, when, after speaking of the old operation as an opprobrium to surgery, he says—"All tissues—viz., the skin,

para-mammary fat, the entire gland, pectoral fascia, and axillary contents—must be freely extirpated."

Before the practice of clearing out the contents of the axilla was generally followed, the writer traced every case of cancer of the breast which had been operated upon in a large hospital during two years in which he acted as resident surgeon, and he does not remember to have found one patient living eighteen months after the operation, the great majority having died long before this period. It should, however, be said that in most of these cases the disease had existed for a considerable period before falling under the surgeon. The sponging out of the wound freely with strong solution of chloride of zinc or corrosive sublimate should never be neglected before the sutures are put in.

If the case be not one in which operation can be recommended when first coming under the attendant's notice, or if the patient refuses to submit to an operation, great care must be exercised in the use of local remedies for the relief of pain. Friction or irritants of any kind must be strongly condemned, and nothing that will hasten the breaking of the skin is to be permitted. If ulceration of the skin has already occurred, the application of any weak antiseptic lotion should be recommended. The application of caustics, like arsenic and others already mentioned, is to be avoided.

Many substances may be now used with the view of lessening pain:

Belladonna extract, rubbed up with glycerin.

Hydrate of chloral (5 to 20 grains to 1 ounce).

Carbolic acid lotion (1 : 30).

Conium ointment (page 47).

Cocaine solutions (1 to 5 per cent.). It may be used in the form of ointment.

Galium aparine, hyoscyamus, belladonna, and stramonium leaves, made into infusion or decoction.

Antipyrine (1 : 100) is recommended, but it often increases pain considerably.

Fuchsine in alcohol (1 : 300) is recommended by Dyer.

Morphine-vaseline, recommended by B. W. Richardson, may be applied on lint wherever continuous pain accompanies the presence of a cancerous tumor. With an ulcerative breach of surface, the following is the formula; the chloroform dissolves the alkaloid, is sedative and antiseptic:

℞.—Vaselini purif.	℥j.
Chloroformi	ʒij.
Morphiæ	gr. iv.—M.

With the supervention of fetor, strong antiseptics are called for. Iodoform is the best, if its odor can be tolerated. It may be freely

dusted over the sloughing or ulcerated mass, or pads of iodoform gauze may be folded over the tumor.

Bichloride of mercury (1 : 500 to 1 : 5000), powdered borax, boric acid or boroglyceride, salicylic acid in powder or the soda salt in strong solution, creasote, carbolic acid, thymol, oleum menth. pip., turpentine, terebene, aseptol, naphthol, pinus pumilio, permanganate of potash (1 grain to 1 ounce), zinci chlor. (10 grains to 1 ounce), and a host of other antiseptics, have been found useful. The best remedy, if the ulcerating mass be very extensive, is liberal and frequently changed pads of carbolic tow, or, should expense be a serious object, large pads of well teased out oakum, laid upon the surface of the tumor, and secured with a light bandage, affords the cheapest and most efficient dressing, without any lotions or other applications.

Hemorrhage has to be sometimes treated, and, as the bleeding point is not easily seized in the midst of a fungating tumor, local hemostatic remedies must be applied. Should the hemorrhage be the result of general oozing, the application of some of the foregoing antiseptics, in concentrated form, will soon cause it to cease. Thus creasote, turpentine, or carbolic acid, smeared over the tumor, will relieve pain, check hemorrhage, and destroy fetor, powdered alum will do likewise.

If the bleeding should be from a vessel of any considerable size—cut across by the ulcerative process—there is no hemostatic to be compared with the puff-ball—licoperdon giganteum. A small pad of the dried fungus placed over the bleeding surface, or thrust into any of the small ravines in the tumor from which blood is spouting or streaming, will almost instantly cause it to stop. (*Pharmacy, Materia Medica and Therapeutics*, fifth edition, page 581.)

CANCER, EPITHELIAL.—See rodent ulcer.

CANCER OF THE TONGUE.—Palliative measures are only justifiable when operative interference is out of the question. Cocaine dissolved in glycerin of borax (1 : 4), frequent applications of carbolic lotion (1 : 100), insufflations of boric acid, or the application of powdered iodoform and bismuth (1 : 10) to any deep ulcers, and the use of deodorizing solutions may be tried.

Extraction of teeth which press upon the enlarged organ, and, in some cases, the section of the gustatory nerve will be required. Ligature of the lingual artery has been done to diminish the rate of growth.

When possible, complete removal of the organ should be attempted, unless when the disease is in a very early stage and confined to the anterior part of the organ, when the tumor may be removed by the knife, scissors, or écraseur.

(For a brief description of the operations for removal of the entire organ, see under Tongue, Diseases of.)

CANCER OF THE GULLET.—Where ulceration has not already occurred, considerable relief will be obtained by the careful and gentle passing of a tapering or olivary bougie. The slightest pressure may

rupture the tube above the obstructing mass, and only the most cautious and tender handling of the dilating instrument is admissible. Good results have followed this palliative treatment when the bougie has been left *in situ* for hours, and if the instrument be hollow, it may be returned in the stricture whilst the food is passed through it into the stomach. The writer used bougies made of laminaria in the treatment of non-malignant stricture of the gullet as early as 1875 with success.

When the passage of food through the narrow and irritated stricture becomes impossible, rectal feeding should be persisted in. Enemata of raw eggs, peptonized food or milk, or milk pancreatized may be given every few hours, and the sensibility of the rectum blunted by the addition of a small quantity of laudanum to each.

In a limited number of cases where an opening was made by the surgeon into the stomach through the abdominal walls, great relief and some prolongation of life has been the result. This has been of late years done very successfully by adopting Howse's method. An oblique incision, two and a half inches long, is made parallel with the margin of the left costal arch, the sheath of the rectus is opened by a vertical incision and the fibres separated with the handle of the scalpel; the coats of the stomach are made to bulge into the incision, and are fixed to the abdominal walls by a double row of sutures tied over a piece of catheter, and the whole left *in situ* for four or six days, after which a small opening into the stomach is made by a sharp tenotomy knife, a catheter is inserted, and food injected through it. The opening in the stomach is gradually dilated with bougies, so as to admit a good sized rubber tube for feeding purposes.

Cancer of Stomach.—The treatment of this grave malady will chiefly resolve itself into the selection of suitable food, and the relief of the various symptoms arising from the pyloric obstruction so commonly present. Should the malignant disease occupy the cardiac end of the stomach the management of the case will be the same as if one of cancer of the gullet; should the body of the stomach be involved the treatment will be upon the same lines as if a simple ulcer existed.

The diet should be of the most nutritious kind possible; at the same time only such food should be given as will be quickly digested in the stomach, or will rapidly find its way through into the intestines. Strong soups strained from all solid particles, concentrated beef essences and juices, thickened with fine farinaceous foods, and milk in unlimited quantity, must form the chief basis of the dietary. In advanced cases, rectal alimentation should be resorted to. The secret of success in this class of cases is to feed continually, but in very small quantity. It is not a very unusual experience to come across cases of cancer or ulcer of the stomach, where incessant, painful vomiting has brought the patient to a miserable state of collapse, through the ingestion of even moderate quantities of solid or liquid food. If the physician orders a diet of soup and milk, or peptonized milk, to be given in such a

case in unlimited quantity, making it a stipulation that only one large spoonful be given at one time, the liquid will pass directly through the stomach into the intestines, and all vomiting and much suffering will stop.

These directions must be literally carried out. It will not do for the patient to take in his hand a vessel of liquid food out of which he is to drink what he considers will about amount to a tablespoonful. The food must be measured in a spoon as if it were medicine.

Stimulants in liberal quantity need not be withheld, as they help the patient materially, and owing to the comparatively short duration and invariably fatal termination of the affection, the alcohol habit need not be dreaded.

The best stimulant is good whiskey or brandy mixed with the milk (1 to 10). Wines, as a rule, intensify the acidity often present, though good champagne is of great use in the vomiting of the latter stages of the disease.

In some cases where the pyloric symptoms and signs are well marked, careful washing out of the stomach by the pump and an India-rubber tube is often followed by great relief. For the treatment of pain and vomiting see under Gastric Ulcer, where the various agents used for this purpose are detailed, but the chief reliance is to be placed in bismuth, combined with morphine and hydrocyanic acid, ice, and counter-irritation.

Digestives, like pepsin and papain, are indicated where there is no reason to believe that an ulcerating surface exists in the mucous membrane. Where there is marked deficiency of free hydrochloric acid in the stomach, this drug can be supplied with pepsin.

The vomiting of acid and yeasty matters is best met by creasote; one to three capsules (1 minim each) may be given three or four times a day. Hyposulphites, sulphurous acid, eucalyptus, and carbolic acid may be given with a view to destroy the sarcinæ in those cases where there is evidence that the food is detained so long as to undergo fermentative changes. Constipation, sleeplessness, and other complications are to be treated upon general principles. Ascites, peritonitis, jaundice, or secondary hepatic derangements are also to be watched for.

The operation of removal of the pylorus has been performed at least one hundred times, and in many cases with marked relief and considerable prolongation of life. It is justified as a radical measure by at least one strong consideration—*i. e.*, that cancer of the pylorus may exist for a very considerable period without any extension of the disease to lymphatics or neighboring parts; and the history of the operation shows that if the shock be got over, the patient may possibly live for three or four years afterward.

The pyloric tumor is drawn out of a wound four to five inches long, made by an oblique incision parallel to the right costal margin. After separation of the omentum, the mass is removed, and the cut ends of

the stomach and duodenum secured together by Czerny's sutures, and returned to the abdominal cavity.

Woelfler has successfully performed the operation of gastro-enterostomy, by which, after exposure of the pyloric tumor and adjacent stomach and duodenum, an incision is made into the free border of the latter beyond the pyloric obstruction, and the lips of the incision are stitched to the lips of a similar incision made in the coats of the stomach near to the pyloric end. No interference takes place with the tumor. The food passes directly from the stomach into the small intestine, though the pylorus is blocked up.

Duodenostomy and jejunostomy, by which an attempt has been made to establish permanent artificial openings through the abdominal parieties into the small intestine in cases of pyloric cancer, have not been followed by results warranting further trial.

Fischer reported a few years ago to the German Congress a case of resection of the stomach. A tumor was felt, which, upon opening the abdomen, was found to be situated upon the great curvature of the stomach. A large portion of the stomach was removed successfully, and in seven days the patient was able to take her nourishment by the mouth. She succumbed five months afterward to a perforating ulcer of the stomach. The cicatrix of the incision could not be discovered, such perfect union having taken place.

Cancer of Intestines.—This generally causes death by obstructing the bowel, hence by dietetic treatment much can be done to prolong life by selecting foods which leave the least indigestible residue. Laxatives, like cascara, sulphur, olive oil, or cod-liver oil, should be employed to keep the motions soft, and feeding by the bowel should be commenced early.

Enterectomy in certain cases affords great relief and prolongs life. The portion of bowel, the seat of cancer, is drawn out through an incision in the middle line below the umbilicus, and the diseased portion excised with scissors, the divided ends of the bowel brought into apposition and sutured with two distinct sets of sutures, one passing through the mucous coat alone (about fifteen in number). The serous coats are next fastened by about twenty-five separate sutures, and the whole returned within the abdominal cavity, which is then closed in the usual way. It is, however, found best to stitch the divided ends of the bowel to the skin wound, so as to produce an artificial anus, which, after a time, can be closed by a further resection, approximation, and suturing of the divided ends, and their final replacement in the abdomen.

The operation of enterotomy may be done, by which an incision in the right inguinal region into the abdomen permits the surgeon to open the first distended coil of intestine which bulges into the wound. This method is applicable to grave cases where one is not justified in performing enterectomy. The distended coil protruding into the abdominal wound is sutured to the lips of the incision, after which the bowel

is freely opened between the two lines of sutures, and an artificial anus maintained.

Cancer of the large intestine, leading to obstruction of the bowel, is best relieved by lumbar colotomy. Amussat's operation of opening the colon, either in the left or right loin and permanently establishing an artificial anus, is the one most commonly indicated.

Cancer of the Liver, hitherto regarded as beyond the reach of surgery, has been quite recently treated by excision. Lücke, after opening the abdomen, excised a cancerous mass situated in the left lobe by drawing it through the abdominal wound, and fixing it there by sutures, the excision being performed by the slow pressure of the elastic ligature. Recovery was rapid, the patient leaving hospital in four weeks.

Cancer of Rectum can only be treated satisfactorily by excision of the diseased portion of the gut, and most satisfactory results may be obtained even in cases where "obstruction" symptoms have been well-marked, provided the disease is within easy reach of the finger, and there is no infiltration into surrounding tissues, and the rectum is quite movable. The whole or a portion of the rectum may be removed. Though the operation is a very formidable one, a good recovery often ensues. Cripps emphasizes the important statement that not more than 15 to 20 per cent. of cases which present themselves are suitable for operation. He insists that no operation should be undertaken, unless there is a reasonable prospect of being able to make a thorough removal of the whole distance. Under ordinary circumstances the finger can explore to a distance of from four to five inches from the anus. If the finger can pass sufficiently beyond the disease to feel a healthy mucous membrane, so far as the height is concerned a satisfactory removal is possible. It is, moreover, essential that the finger should determine that the rectum is movable and free, and that no infiltration into surrounding organs has occurred.

The writer had a case under observation where, after symptoms of obstruction had existed for several weeks, excision of a large portion—three inches of strictured bowel—was most successfully performed by Mr. Cripps nearly four years ago. The patient is still living, and most marked relief and great increase in body weight followed. Two years after the operation there was no sign of a return, and the writer believes there is no return, though he has not seen the patient for a considerable time.

F. Marsh advocates a preliminary colotomy or colectomy in all cases in which a proctectomy (excision of the rectum) is to be undertaken. Mitchell Banks, who prefers lumbar to inguinal colotomy, instead of merely opening the colon laterally, and stitching the lateral orifice to the wound, cuts the bowel clean across, and fixes the upper end. This he considers a necessary preliminary to proctectomy or excision of the rectum.

If the stricture is beyond the reach of the finger, and there be evi-

dence of infiltration of uterus or bladder, lumbar colotomy is the only palliative treatment when obstruction has set in, but if the disease is so extensive as to lead the surgeon to believe that it will very soon cause the death of the patient apart from the obstruction, even colotomy is not justifiable. Enterotomy may, under such circumstances, be allowable.

Cancer of Uterus.—The indications requiring treatment are pain, hemorrhage, and fetor. The only satisfactory treatment is removal of the disease when this is possible.

The general health of the patient should be attended to, diet unlimited, and moderate amount of stimulants in the later stages. The patient, if confined to bed, should be placed in the upper room, with a sunny aspect and good ventilation. The air of the apartment should be kept sweet with terebene, or any fragrant pine product. Sawdust sprinkled with oil of turpentine is a good disinfectant, and is not suggestive. The bowels should be kept natural with a laxative like cascara, or sulphur, or by enemata of tepid water.

Pain will be best relieved by morphine or opium in the form of suppository. It is a mistake to begin with hypodermic injections; ¼ grain by bowel, or 1 grain of opium by the mouth, will generally be sufficient to lull pain at first, but at a later stage often large doses are required hypodermically. Medical pessaries are not so satisfactory as suppositories.

Fetor is best met by thorough cleanliness and good nursing. Antiseptic injections: borax in saturated solution, carbolic acid (1 ounce to 3 pints), bromine (1 : 500), acetate of lead (1 ounce to 1 gallon), permanganate of potash (5 grains to 20 ounces), bichloride of mercury (2 grains to 1 pint), creolin (1 : 20) may be employed.

Cheron recommends the following deodorizing injection:

℞.—Acid. salicylic gr. viij.
Sodii salicylat. ʒiij.
Tinct. eucalypt. ʒvj.
Aquæ destillatæ ℥vj.—M.

S.—Three tablespoonfuls to be added to one or two pints of water, and used as a douche every three or four hours.

The effect of these injections is but temporary, and their disinfecting or deodorizing qualities last but a very short time—a matter often of minutes—and it is necessary to leave some more concentrated preparation in the vagina to prevent the patient becoming a burden to herself and her friends.

Iodoform is the most powerful of all remedies. Pledgets of cotton wool or lint, soaked in a mixture of iodoform, rubbed up with glycerin, destroy all trace of odor. 1 : 40, or in bad cases 1 : 8, may be employed, and left in the vagina all night.

Playfair uses in a similar way a mixture of 1 ounce glycerin of carbolic acid and 8 ounces glycerin of tannic acid.

Betrin uses tampoons soaked in equal parts of terebene and almond or olive oil, after an abundant preliminary douche of Condy's fluid and water.

Oil of turpentine, shaken up with water (1 : 100), may be used as an injection, or mixed with olive oil (1 : 4), it may be applied on tampoons.

Packing the vagina with powdered boric acid is a good plan. The plugs should be removed twice a day, and the vagina well syringed with any of the above lotions each time.

Hemorrhage is best checked by local applications or plugging of the vagina; hemostatic remedies by the stomach are not to be depended upon. Should the bleeding be alarming, plugging must be resorted to, and if from the body of the uterus, the os being dilated, strong chloride of iron solution (1 : 4) may be injected. Cold saturated solution of alum answers well in most cases. If the source of the hemorrhage be within reach and visible, the bleeding point may be touched with any strong caustic, as concentrated liq. ferri chlor., or a minute pledget of lint soaked in it may be left in contact, and the vagina plugged with wool soaked in weak carbolized oil (1 : 20). The writer's however, never uses carbolic acid where there is a distinct fetor; the combination of the odor of the acid with the fetor makes generally a new volatile compound of still more disgusting smell. Chloride of zinc freely applied to the bleeding spot is the most reliable of all applications; it also checks the disease by destroying the growth.

The galvano- or thermo-cautery may be employed; if the hemorrhage recurs the bleeding surface may be thoroughly scraped with the curette. The puff-ball may be pushed through the speculum and left *in situ* as a plug in severe cases. Ice may be also useful sometimes, and it has the advantage of being easily used by the patient.

A powerful continuous current (Apostoli's method) is effective.

The surgical treatment of uterine cancer will depend upon the portion of the uterus invaded. The epithelial growths springing from the os and cervix may be removed, in some instances completely, without interfering with the body of the uterus. Caustics—potash, and zinc chloride, arsenic, alcoholic solution of bromine (1 : 5), strong nitric and carbolic acids—are used, but seldom good results follow. Often the inflammatory action following their irritant action gives a fillip to the disease. The three first on the list just mentioned may eat their way through diseased tissue, but unless applied with great skill and care their action cannot then be stopped, and the danger is thus so great that their use is to be condemned as a routine method. The remaining members on the list are too superficial in their action to be of any permanent benefit.

If chloride of zinc be used by Braithwaite's method, excellent results may be obtained in selected cases. He takes the fluid resulting

from the deliquescence of the solid zinc chloride, thin layers of cotton-wool are wetted in this saturated solution, and the superfluous moisture is removed by lightly pressing them between sheets of blotting-paper. These are applied for twenty-four hours, the healthy parts being protected by tampoons soaked in soda solution. By care and the re application of the caustic the disease may be destroyed to any depth. The healing process afterwards is followed by great contraction and puckering of the parts.

Scraping away of the diseased surface by means of Simon's sharp spoon, or by the ordinary curette, is a much better partial operation than the destruction of the tissue by caustics. After all the diseased growth is thus removed down into the sound tissue by firm scraping, the cautery is applied, and a still further layer destroyed, or caustics may be used with much advantage.

Curetting may be combined to great advantage with chloride of zinc. After all the diseased tissue has been thoroughly removed by the spoon, cotton-wool damped in saturated solution of the caustic may be thoroughly applied to the raw surface to destroy rays of cancerous growth which escape. Many practical operators prefer this method to the cautery or knife. The writer has several times employed it, and watched its effects in the hands of others, and believes that it is the best of the partial methods of dealing with uterine cancer.

Amputation of the cervix by the knife or scissors, and stitching together of the mucous membrane over the wound, or the insertion of deep sutures into the incised lips of the cervix after the removal of a wedge-shaped mass of malignant tissue, is also followed by good results in a fair proportion of cases at the early stage. The entire cervix may be amputated. Marion Sims applied strong cautics after these partial operations. Chloride of zinc (1 : 1 or 1 : 2 of water) is applied upon plugs of lint three or four days after the amputation, and left *in situ* for one or more days, the vagina being protected by tampoons of cotton-wool soaked in saturated solution of sodæ bicarb.

Schrœder has applied the actual cautery freely after cervical amputation with satisfactory results.

Where the disease has attacked the cervix high up, or the body of the uterus, the entire organ should be excised (hysterectomy). Freund's method of accomplishing this by abdominal incision, has largely given way to Schrœder's or Billroth's plan of removing the uterus through the vagina, and many cases of long immunity have followed the operation, though in cervical cancer there does not appear, to many operators, to be any advantage in removing the entire organ if the disease can be got away by amputating the cervix, as is generally the case.

T. Keith, after much experience, states that he never would hesitate between the partial and complete removal, as there may be cancerous nests in every fundus, though the disease may seem quite localized. He performs vaginal hysterectomy with scissors, and has never lost a

case from hemorrhage. This latter complication is more likely, in his opinion, to follow the use of the cautery, as its action must be incomplete.

Upon the other hand, Byrne states that he has operated upon 367 cases of uterine cancer with the galvano-cautery, and the average period of exemption in known cases was eight years and seven months. He amputates the cervix with the loop, and cauterizes the mucous membrane of the uterus and the stump by an instrument passed into the cavity. Notwithstanding the fact that cancer of the cervix tends not to pass upwards into the uterus, but to spread into the surrounding tissues upon its return in the stump, the total operation is steadily gaining ground in this country, and upon the Continent it is nearly always preferred to the partial operation. Zucker Kandl removes the uterus from a perineal incision, and Kraske resects one sacral wing along with the coccyx.

CANCRUM ORIS.

Constitutional treatment is of great importance in this formidable affection. Nutritious diet, with stimulants, free ventilation, and everything that can improve the general condition of the ill-fed and badly cared-for child must be insisted upon, but no time is to be lost in resorting to the only local treatment available, *i. e.*, the free application of powerful caustics to the sloughing spot. Strong nitric acid is far the best remedy, and it should be applied, under chloroform, after the inside of the cheek is exposed and wiped dry, care being taken to prevent the acid finding its way to the healthy surrounding mucous membrane. Poultices may be applied externally; but if a gangrenous patch is visible externally, it should be cut or scraped out, and the strong acid applied freely to the margins of the hole.

Stephen Paget recommends that desperate cases should be promptly treated by excision of the slough and surrounding ring of healthy tissue by the knife, Trousseau applied the actual cautery.

In mild cases weak corrosive sublimate solutions may be used, and even in severe cases speedy recovery has followed their use. Gates and Kingsford report success in three cases, by cutting away all sloughing masses and swabbing the ulcerated surfaces once or more daily with a 1 : 500 bichloride of mercury solution, whilst a 1 : 1000 solution was kept constantly applied. Healthy granulations soon appeared, and recovery was rapid.

Ammonia and cinchona, with stimulants, must be pushed, and if concentrated beef essences and soups cannot be swallowed, they should be given by the bowel or by the nasal tube. The local after-treatment will consist of free applications of chlorate of potassium, dusted in fine powder over the sore, or the mouth and cheek may be syringed with a solution of the drug (1 : 50) several times daily. The most rigid cleanliness is essential, and the syringe should be used almost

constantly at first. Iron must be given internally, and the most liberal feeding kept up for a long period, The resulting deformity may be remedied afterward to some extent by operation.

CARBOLIC ACID POISONING—See under Poisoning.

CARBUNCLE.

In the management of this affection a generous diet, with stimulants, and, if possible, open air walks or drives are essential. Iron, internally, in doses of 15 minims of the tincture with 2 or 3 grains quinine four times daily, should be given from the beginning, with saline purges every second morning. Sulphide of calcium in ½ grain doses every two hours has been used to influence the suppurative process, and arsenic is useful in chronic cases. If great prostration be present, a mixture of 2 ounces spt. ammon. aromat. and 2 ounces tinct. cinchonæ may be given in doses of a large teaspoonful with a tablespoonful of brandy in a wineglassful of water every two hours. Opiates, or antipyrine may be given to relieve pain and to assist sleep. Local treatment should consist of a free crucial incision across the face of the carbuncle, through skin and slough down to the healthy tissues beneath. A hot poultice, rendered antiseptic by a coating of boric or iodoform ointment, should be applied, but constant poulticing is to be avoided after the early stages.

All the benefits of a poultice during the healing stage may be obtained by any antiseptic lotion on lint, covered with oiled silk, and upon the top of which a pad of cotton-wool is fixed with a bandage or strapping.

Carbolic acid is injected into the slough by some surgeons without making the crucial incision. Recently this treatment has been modified by diluting the acid and injecting small quantities (about 1 drachm in all) into different parts of the tumor. The following is the usual formula, and excellent results are reported:

℞.—Acid. carbol. pur. ʒj.
Glycerin. purificat. ʒv.
Aquæ destillatæ ʒv.—M.

The writer, after making the two deep incisions at right angles to each other, thrusts deeply into the slough at two or more points a piece of lint wrapped around a stout director and dipped in the strongest carbolic acid.

It is a good practice in some cases to push in small fragments of caustic potash through the openings in the carbuncle.

Lately splendid results have been obtained by playing the spray of a carbolic acid lotion (1 : 50) upon the carbuncle for about fifteen to twenty minutes every four hours, and avoiding incisions. This treatment can be combined with incising or using caustics or poultices.

Strapping, by firmly getting a good hold upon the healthy tissues on each side, hastens the discharge of the slough and gives great relief, a fair opening being left in the centre of the plaster for the drainage of all discharge.

The old expectant treatment, by poulticing and hot fomentations, is tedious, and favors blood poisoning, and the method of applying weak iodine under compresses is also of little use in most cases. Pain may be relieved by applications of extract of belladonna rubbed up with glycerin, and smeared over the part, or applied upon the surface of the poultice. Cocaine solution, 2 per cent., may be applied upon oiled silk, or chloral solution (5 grains to 1 ounce) is a good lotion at a later stage.

Blistering, arnica, collodion, and mercurial ointment, have been advocated; but the free incisions, followed by poulticing and antiseptics, afford best results.

Ether, sprayed upon the slough, is said to hasten its removal.

Recently, Teale and Page have reported cases where "scraping" was performed by a Volkmann's spoon or Lister's scraper with great success. After a crucial incision, the slough is thoroughly scraped out, the cavity washed with an antiseptic, and the wound dressed with iodoform.

Should there be much fetor, sublimate solution (1 : 5000), or turpentine, or terebene, or syringing with solution of chlorinated soda (1 drachm to 1 ounce), or Condy's fluid and water may be employed. Iodine liniment, very freely painted round the base, gives relief, and subdues pain caused by congestion in the surrounding healthy tissues after the carbuncle has been incised.

The severe form of carbuncle attacking the face, must be treated upon the same general lines—supporting diet and stimulants, free incisions and antiseptics.

CARCINOMA—See Cancer, page 98.

CARIES.

Bone caries being, in the great majority of cases, a local manifestation of struma or tubercle, constitutional treatment is of the greatest importance, and there can be no more serious mistake made by the surgeon, than to confine his efforts to the local management of the case. The best treatment is that indicated in strumous affections: Cod liver oil and malt extract; milk in large quantities; the removal of the patient to a seaside place sheltered from east winds and protected from the north; iodides (chiefly ferri iod.), phosphates, hypophosphites, calcium chloride, gold and barium salts, and other remedies mentioned under scrofula and tuberculosis.

Local treatment will vary with the anatomical position of the bone affected. If in the proximity of a joint, rest must be insisted upon,

and this should, if possible, be supplemented by the application of a splint, or immovable apparatus, which will enable the patient to spend the greater portion of his time in the open air. It is a serious matter when patients, the subject of bone caries, are sent to bed, especially in crowded cities.

Where matter is pointing, a good deep and free incision into the bone, through all intervening tissues, is desirable, and, if the case be a chronic one in which partial drainage has been established by nature, it will be wise to plan the incision so as to take in any old sinuses that may be within its sweep. Poulticing, except to allay pain and tension, should be avoided. The free use of antiseptic solutions, as hydrarg. bichlor. (1 : 5000); carbolic acid (see under Abscess) is far better. The sinus or wound may be frequently syringed out with any such lotion, and then covered with lint soaked in it, and a piece of oiled silk laid over all. A drainage-tube should be left *in situ* if the wound or sinus be deep.

Various methods of treating the disease, by injecting substances into the sinuses, have been advocated. The writer has seen excellent results from the injection of the undiluted compound tincture of benzoin, as practised by the late Professor Gordon. Pollock advises the injection of strong sulphuric acid and water in equal quantities; the strength of the acid to be gradually increased until it is injected pure.

Red precipitate upon a moistened probe was an old method of setting up new action in the sinus and bone.

Turpentine, caustic potash (liquefied), tincture of iodine, Villate's solution (zinc and copper sulphates, liq. plumbi, and vinegar), and many other compounds have been used for the same purpose with vary success.

If the carious bone is easily reached, strong caustics—as caustic potash, chloride of zinc, or the actual cautery—may be freely applied to the carious cavity after a free incision through the skin. The bone may be entirely excised, which is the best treatment for the small bones or os calcis, when extensively diseased.

The great surgical procedure is gouging, and it was the invariable rule to make an early incision, retract the lips of the wound, dissect down to the bone, and gouge away as much softened bone as possible, wash out the wound, and allow the cavity to granulate, and often rapid cures occurred. The very class of cases benefited most by this treatment will also get well without it, and the operation of gouging should not be lightly undertaken until every other means has been tried. The cavity left in the healthy bone should be well swilled out with strong carbolic lotion, bichloride solution (1 : 500), chloride of zinc (1 : 15), and packed with lint saturated with any antiseptic solution or with iodoform gauze, and dressed in the usual way. After a few days the lint should be withdrawn, and the cavity syringed out twice a day with antiseptic solutions.

See under tuberculosis for an account of Koch's method, and for

the still more recent plan of Lannelongue by injecting chloride of zinc into the surrounding tissues. (See also under Necrosis.)

CARIES OF SPINE.

Belonging to the strumous group, this affection can only be treated by thoroughly constitutional measures, supplemented by local appliances and rest, cod-liver oil, with malt extracts, iodide of iron, hypophosphites, and the various remedies applicable in wasting diseases and tubercle or struma (which see), liberal diet of peptonized milk with koumiss (page 23), and beef juices or meat jellies. Open air when possible, and change to a sheltered seaside spot, with cheerful surroundings, should be advised.

In the early stages of the disease, where the diagnosis is based upon neuralgic pains or numbness in the legs and other symptoms before there is any local deformity, absolute rest in bed or upon a hard mattress in the open air is essential. This treatment must be insisted upon for months. Local pain or tenderness over the spinous processes of one or more vertebræ, at this early stage of the affection, my be relieved by couter-irritation. Strong liniment of iodine may first be tried; should it fail to give relief, blisters may be tried. They should be small, and only kept on for two or three hours, and then appliod every three or four days. It is advisable not to break the skin, as the best position for the patient is to lie flat upon the back, which would be impossible with open sores over the spine.

In adults, the application of Corrigan's iron gives relief. The insertion of issues and the painful use of moxas are deservedly passing out of date, as is also the questionable practice of leeching.

In mild cases pain is often relieved by wearing a piece of silk soaked in liniment of chloroform, and covered over with oiled silk. When the acute symptoms have passed away, and the patient begins to feel the recumbent posture irksome, the time has come for the application of some mechanism whereby the weight of the upper part of the body may be taken off the diseased vertebræ. Where the lesion is located in the last one or two dorsal and first or second lumbar segments (by far the most common region), the application of a plaster jacket is by far the best appliance. The plaster jacket, however, will do nothing which prolonged rest in the recumbent position will not achieve, but the disease being one in which the general health and constitutional vigor of the patient are seriously impaired by many months or years in bed, it is a matter of immense importance if the same rest can be given to the diseased spot while the patient enjoys an outdoor life, accompanied by exercise and change of scene.

In *very* young children the situation is different. They can be carried or wheeled about while in the lying posture, and have all the advantages of open air and change of scene.

To apply the jacket, the patient should be stripped of all clothing

and a neatly-fitting woven merino vest, without buttons, should be put on. It should reach below the buttocks. He is then suspended by the usual pulley and cord appliance, by means of a strap passing below the chin and occiput, and another under each armpit. It is not generally necessary to raise him entirely off the ground; for nearly all purposes his toes may be left touching, as it gives confidence to him, and if absolutely complete extension be needed, by flexing the knees very slightly the toes will, of course, leave the ground.

The vest is pulled gently downward and all wrinkles removed, and a pad placed inside it over the pit of the stomach. This is to be slipped out afterward, its object being to leave room for distension of the abdomen after meals. Coarse muslin bandages, thickly sprinkled over with dry plaster-of-Paris, are to be rapidly immersed in cold water, slightly squeezed out, and applied over the vest in layers, extending from about an inch below the iliac spines to the armpits. An assistant smoothes down each layer of bandage as it encircles the trunk, and, from time to time, applies with his hand some more plaster, made into a cream with water; or, if the bandage appears to have been too well moistened, he rubs over it a little dry plaster as the operation proceeds.

For small children, three inch bandages three yards long will answer; four or six of these may be used. Adults require longer and broader bandages, and a larger number of them.

Should the patient be thin, small pads of wadding may be placed over any bony prominences outside the vest before the application of the first bandage, which may be passed around the pelvis and brought obliquely upward as it encircles the abdomen, fixing permanently in their position all woolen pads over the iliac spines or prominent vertebræ. After the application of the last bandage, the assistant applies some fresh plaster, rubs it down with his hand, and finishes the jacket off, leaving a smooth and even surface. It sets in a few moments, and the patient may be taken down and laid flat upon a hard mattress before the fire for a short time before being carried to bed, from which he may get up next morning and run about. By turning up the tails of the merino vest over the plaster, near the end of the operation, a more presentable finish off is obtained. The jacket may be worn for two months or more, and may be cut up, punched with holes, and laced on again, if found quite satisfactory. In this latter case it can be taken off at night. Several jackets may be applied during the course of the disease.

When consolidation has advanced to a considerable degree, the plaster of Paris jacket may be replaced by one made by poroplastic felt. Jackets ready-made, of various sizes and shapes, may be obtained from any instrument maker, and rapidly adjusted to the patient's body when suspended. The felt jacket is put into an ordinary range oven, and, in a few minutes, it becomes quite soft and pliable, in which condition it is moulded to the chest and abdomen, fastened with buckles,

and the setting process is complete in five to ten minutes, during which time the suspension is to be kept up. It can, every four or six weeks, be re-heated and applied again, as it yields a little with the heat of the patient's body. Some cases of spinal caries, in weak and thin subjects, can be treated in this way from the first. It has the great advantage of being easily taken off and put on, and allows of daily inspections if abscesses are feared.

In disease of the highest cervical vertebræ, the patient must be laid upon his back, with the neck fixed in a comfortable position with pillows and sandbags, as long as any acute symptoms are present. Afterwards, a modification of the plaster jacket may be applied, carrying narrow plaster bandages around the forehead, over the ears and occiput, and under the armpits.

In disease of the lower cervical segments, Sayre's jury-mast apparatus should be applied. It may be adjusted in connection with a poroplastic instead of a plaster of Paris jacket.

Hadra has suggested the heroic procedure of wiring of the vertebræ after other measures, such as trephining of the vertebral arches, etc., had failed.

(See under tuberculosis for the details of Koch's method of treating of tuberculosis in bone.)

Lannelongue's new method of treating osteo-arthritis and caries, by deep injections of the chloride of zinc, will be also found detailed under tuberculosis.

CATALEPSY.

The treatment of this condition means generally the treatment of hysteria, of which it may, however, be the only symptom. If there be loss of consciousness associated with the muscular rigidity, the patient should be aroused by a good dash of cold water thrown suddenly over the head and face. Should this fail, a smart electric shock from a frictional machine, or what is much more convenient, a pretty severe induced current may be passed through the arms. It should be suddenly applied in full strength, and not turned on gradually. One pole may be applied to the upper part of the spine, and the other to the rigid limb. Gowers states that a pinch of snuff may soon restore consciousness. Emetics often dispel all symptoms, but the patient is either unwilling or unable to swallow them, and it is best to administer $\frac{1}{10}$ grain apomorphine hypodermically. After the attack passes off, drachm doses of the ammoniated tincture of valerian, with a little asafœtida, have a good moral influence. Should there be a very distinct series of attacks, the removal of the patient from her surroundings and a good course of massage and forced feeding will prevent a return.

Cannabis indica in small doses (5 to 10 minims of the tincture) is said to give good results, though the rationale of its action is obscure,

and the general objections to all narcotics in affections of this sort must not be forgotten.

CATARACT.

The only satisfactory treatment is operation. In the early stages of nuclear cataract, smoked or dark glasses give some relief by favoring dilatation of the pupil, and the sight may be much improved by keeping up moderate dilatation by using an ointment consisting of $\frac{1}{8}$ grain atropine, and 4 drachms vaseline,

Operations are of various kinds: 1. The removal of the lens entire through a large corneal or sclero-corneal wound, leaving the capsule behind. 2. The removal of the lens in a similar way along with the capsule. 3. By causing absorption or solution of soft cataracts by admitting the aqueous humor through needle punctures made in the capsule. 4. By removal of soft cataracts through a suction syringe or curette after previous needle punctures made some days before. 5. By couching or dislocating the lens backward into the vitreous. This operation is seldom practised now. 6. By McKeown's method, whereby unripe cataracts are operated upon, irrigation being used to clear out the residue of the lens.

Suction and needle operations, generally speaking, are not applicable after thirty-five or forty years of age. The use of cocaine renders most cataract operations possible without chloroform or ether—a vital point, considering the dangers attending the act of vomiting or retching.

Some lamellar cataracts, with a wide, clear, marginal zone, may be best treated by doing an iridectomy, which will uncover a transparent portion of the lens, and give fairly good vision,

In young subjects, the best operation is the needle one, and some opaque lenses may be completely removed by a few insertions of the needle through the cornea and laceration of the anterior capsule and fibres of the lens, and exposure of them to the absorptive action of the aqueous humor, the posterior capsule being left behind to shut out the vitreous. The iris must not be interfered with or touched by the needle, and atropine solution (1 : 100) must be freely used before and for a time after the operation, or until the next insertion.

The operation of linear extraction is applicable to soft cataracts where the needle fails, and to other cataracts where time is an important element, and to some cataracts where needling has already been tried. A short incision is made with a triangular keratome a little within the margin of the cornea; iridectomy is unnecessary. The capsule is opened by the cystotome or by the point of the keratome. By slight pressure on the globe the soft lens substance is evacuated piecemeal, any portions remaining behind being soon absorbed, as in the needle operation. If instead of pressing out the softened lens a fine syringe be inserted, the matter may be sucked out through it.

This is known as the suction operation, and, of course, is only applicable to very soft cataracts.

In the treatment of hard cataracts no operation should be undertaken if there be evidence of deep-seated disease. Should there be total absence of all perception of light though the cataract be very dense, no operation should be recommended, and under no circumstances should both eyes be operated upon at the same time.

There are many modifications and varieties of operation for the extraction of hard cataracts. Graefe's modified linear operation is performed (1) by making an incision slightly beyond the sclero-corneal junction by a long narrow knife; (2) that part of the iris beneath the incision is excised; (3) the anterior capsule of the lens is freely lacerated; (4) by gentle pressure the hardened lens is squeezed out of its capsule and through the incision; (5) the "toilette" of the wound is to be carefully seen to, and irrigation, by means of McKeown's syringe and needles, is far preferable to pressure, either digital or instrumental.

The flap operation is performed by making an incision within the visible margin of the cornea for about half its circumference, and concentric with it, by entering a Beer's triangular knife at the margin of the cornea and cutting out a semi-circular flap without making an iridectomy. The capsule is opened by the cystotome, and the lens easily escapes through the opening; spontaneously or upon very gentle pressure.

After operation the patient is put to bed in a darkened room, and a piece of linen, covered by a pad of absorbent wool, placed over each eye and bandanged by a four-tailed knitted cotton bandage. This need not be disturbed for forty-eight hours (if all goes well), when a few drops of atropine solution (1 : 100) may be instilled and the bandage is applied.

After the fourth day he may be allowed to sit up, and the bandage may be removed at the end of ten days and a shade substituted.

Chisolm operates upon all senile cataracts without iridectomy. He cleans the anterior chamber as carefully as possible, and replaces the iris so as to establish a round, well-contracted pupil with the lips of the corneal wound well adapted. He then instills a few drops of eserine solution (half per cent.), and closes the eye with a strip of transparent adhesive plaster, after which the patient is permitted to walk to his room and recline upon a sofa; only direct sunlight is excluded from the sick chamber. He eats his regular meals, washes himself, sees his friends, walks about unrestrained, dresses and undresses himself morning and evening. Atropine is instilled upon the fourth or fifth day, when the plaster is removed, and the eye requires no further protection.

McKeown's method of using irrigation marks a very distinct progress in ophthalmic surgery. Those who have reported unfavorably of it appear not to have grasped the principles upon which the procedure

is founded. In a considerable number of ordinary cataract operations, where the cataract is regarded as ripe before operating, the surgeon finds that the cortex remains and gives much trouble. Here massage, pressure, and the use of the scoop are the usual means by which the residual cortex or debris is to be cleared away.

It is, however, in dealing with unripe cataracts, in those where, before operation is attempted, the surgeon knows that he is dealing with a transparent and sticky cortex, that the plan of irrigation is most valuable. The term irrigation is an unfortunate one; it would be better to speak of it as "the method of removing the cortex by fluid pressure." By it the cataract patients, who were formerly doomed to wait for months or years till their sorrow became ripe, can, in the majority of cases, be operated upon with every prospect of success without delay. This is a great gain in the case of the poor, and artesans or laborers.

The operation is done according to the ordinary methods with or without iridectomy, and after the extraction of the lens the fine nozzle of an irrigation apparatus (a suspended bottle, with a bent syphon tube in the interior, filled with about 4 ounces of warm distilled water previously boiled) is introduced through the wound. The strictest antiseptic precautions are used. As the stream of sterilized water is introduced inside the capsule, "there is no pressure on the cornea, no pushing back of the vitreous, no squeezing toward the wound of the hyaloid membrane. The current of water under the control of the surgeon flows inside the capsule of the periphery, and returns along the anterior and posterior capsule, searching every corner, and bringing with it fragments of cortex from every part of the capsule. The force is equable and gentle, and acts not only on the parts we see, but on those concealed by the iris, and quite as well upon the parts concealed as on the parts visible." The complete extraction of the cataract, therefore, becomes simply a question of physics, of relative resistance, and relative well directed and suitable force.

CATARRH—See Bronchitis.

If the local symptoms be distressing at the beginning of an attack, and there be much sneezing and coryza, Ferrier's snuff may be insufflated. The following is the formula for this powder:

℞.—Bismuthi subnit. ʒvj.
Pulv. acaciæ ʒij.
Morphinæ hydrochlor. gr. ij.—M.

S.—To be used as directed.

A mixture of iodoform and tannin may be employed in the same way. Plugs of cotton wool saturated with cocaine (4 per cent.), or menthol (8 per cent.), may be inserted into the nostrils. Solution of nitrate of silver, 10 grains to 1 ounce, may be freely applied with a

brush, or zinc sulphate, five grains to 1 ounce, may be tried. Sprays of weak carbolic solution (1 : 80), ipecac wine or sulphurous acid, inhalations of ammonia, ammonium chloride, carbolic acid, benzoin (tinct. benzoin. comp.), camphor, weak iodine solutions (30 minims of tincture to 1 ounce of water) eucalyptus, and many other remedies mentioned under Bronchitis, may be used. In the chronic form of nasal catarrh, the chloride of ammonium inhaler is the best.

Benzoate of soda in drachm doses may be given at the beginning of an attack, and often one full dose of morphine cuts short the coryza before the irritation extends downward. Belladonna or atropine (1 minim of the 1 : 100 solution), often affords relief if given every six hours. (See also under Hay Fever.)

CEREBRO-SPINAL FEVER—See Meningitis, Cerebro-spinal.

CHANCRE—See under Syphilis.

CHAPPED HANDS.

The skin should be protected as much as possible from atmospheric changes, and when washed or wetted should be carefully rubbed dry with warm towels. The practice of partially drying with damp clothes, and then heating before a fire, has much to answer for in causing the affection. A superfatted soap (vinolia) is the best, and of all the numerous applications there is none to equal the following ointment, which frequently works wonders in one night:

℞.—Liq. carb. deterg. ℥jss.
Hydrarg. ammon. gr. xxv.
Lanolini ℥ij.—M.

This applied freely at night with gentle friction, and covered with chamois gloves, very often removes the condition after a few days. Other good applications are glycerin, glycerin and rose water (1 : 5), glycerin and Friar's balsam (4 : 1), glycerin and eau de cologne (2 : 1) glycerin of starch, glycerin and diluted lead solution (1 : 8), glycerin and hydrastis (glycerin, 3; tinct. hydrastis, 1; rose water, 10), vaseline, and cold cream.

CHILBLAINS.

In the early or erythematous stages, the proper treatment is to bring the circulation of the part to its normal condition by friction with a stimulating liniment. Thus, when first noticed, if the chilblain is perseveringly rubbed with the following application, it soon disappears:

℞.—Spt. camphoræ ℥ij.
Tinct. capsici ℥j.
Tinct. cannab. ind. ℥j.
Olei cajuputi ℥j.—M.

Lin. camph. comp. is a good application, as is also the following:

℞.—Lin. saponis ℥iij.
Chloriformi ℥j.
Lin. belladonnæ ℥iv.—M.

With some patients, one good application of liniment of iodine with a brush is followed with satisfactory results. Arnica should never be used, and aconite gives relief, but leaves matters worse ultimately. It relieves the itching. Belladonna liniment painted on also affords relief, and does not interfere with the local nerve supply. Equal parts of turpentine and olive oil, with ½ part of chloroform, is a good application. Oil of eucalyptus may be also rubbed in before the skin breaks, and a little thymol or menthol may be added.

If blebs form, they should be snipped, and the part dressed with the following ointment:

℞.—Ung. zinci oxidi ℥j.
Tinct. benzoini comp. ℥ij.
Lanolini ℥iv.—M.

Precipitated carbonate of zinc ointment, 8 parts, balsam of Peru, 1 part, is a very good ointment. Plain basilicon ointment is perhaps the best of all applications at this stage if applied spread upon lint. Flexile collodion may be used where dressings cannot be worn, and it is best if applied before the skin breaks. A 20 per cent. ichthyol-lanoline ointment makes a very valuable dressing to the sores.

Should the ulcer be tedious in healing, it may be treated as an ordinary sore, and a weak solution of chloral hydrate (5 grains to 1 ounce) is the best application, or any of the numerous methods and drugs mentioned under Ulcer may be resorted to.

Besnier treats chilblains by bathing the hands in a decoction of walnut leaves, drying and rubbing in spirit of camphor, and dusting over with a powder consisting of salicylate of bismuth, 1 part; starch, 9 parts.

Vigorous exercise in the open air, even in coldest weather, avoidance of heating the hands and feet before the fire, a generous diet, warm flannels, and no hot water bottles should be allowed in bed. The lowing is a good remedy for internal use:

℞.—Tinct. ferri chlor. ℥iv.
Quininæ sulph. ℥j.
Tinct. digitalis ℥ij.
Glycerini ℥ij.
Aquæ ad ℥vj.—M.

S.—Take a teaspoonful in a wineglassful of water, four times a day, after meals.

Ichthyol internally has been recommended, but the writer has never tried it. He has observed excellent results from nine Blaud's pills in the day.

CHLOASMA.

Confining the term to the affection characterized by the presence of pigmented spots (ephelides or freckles) or patches, caused by the deposition of pigment in the cells of the rete mucosum, the treatment will be to destroy the epidermis in which they are situated. Hebra's method is to apply a lint compress for four hours, soaked in solution of bichloride of mercury (1 : 100), letting out the blister formed, and dressing the resulting raw surface with powdered starch; or 8 grains of the mercurial salt may be dissolved in 8 ounces of almond emulsion, and sponged over the spot several times daily. Unna applies a plaster made with hydrarg. ammon. for twelve hours, and dresses afterward with an ointment of bismuth (1 drachm to 1 ounce). Tincture of iodine, carbolic acid, sulphurous acid, peroxide of hydrogen, acetic acid, and many other mild counter-irritants are also successful.

Crocker uses an ointment of 10 to 20 grains of veratrine to 1 ounce of lard.

Cantharides should never be employed; it increases pigmentation; so does mustard. Wilson uses potash soap and alkaline lotions. Chrysarobin is efficacious, but owing to its staining properties, it should never be used when other agents do so well. The large patches of chloasma on the foreheads of pregnant women, or in those suffering from uterine or ovarian irritation, disappear when the cause is removed.

CHLORAL POISONING—See under Poisoning by Chloral.

CHLOROFORM NARCOSIS AND CHLOROFORM POISONING

will be found referred to under the heading of Poisoning by Chloroform (where also will be seen the report of the Hyderabad Commission.)

CHLOROSIS.

The treatment of this condition has been referred to in discussing the management of anæmia and amenorrhœa, and it may be summed up in the word "iron." Blaud's pills, 2, four times daily; 30 to 60 minims of dialysed iron; or 15 minims of the ordinary tincture, well diluted, are the best preparations. The dose of the metal, in whatever preparation selected, should be large and often repeated.

The constitutional treatment is also mentioned under the above-named conditions. It may now and then, in rare cases, be found that the results of iron soon cease after stopping its administration, and it will be well to leave off for a period, in which arsenic may be given, or the iron and arsenic may be given together.

Albuminate of iron has been much praised, and enemata of defibrinated blood of oxen has given excellent results lately. (See Anæmia and Amenorrhœa.)

Sir Andrew Clarke insists upon the necessity of giving purgatives, and gives one-sixth part of the following twice a day: Ferri sulph., 24 grains; Magnes. sulph., 6 drachms; acid. sulph. arom., 1 drachm; tinct. zingib., 2 drachms; inf. gent. comp., ad 8 ounces.

When this acid mixture produces sickness, and dries the skin, and is badly borne, he prescribes the following:

℞.—Ferri sulphatis	gr. xxiv.
Sodii bicarb.	ʒij.
Sodii sulphatis	ʒvj.
Tinct. zingiberis	ʒij
Spt. chloroformi	ʒj.
Infus. quassiæ	ad ℥viij.—M.

S.—One-sixth part twice daily, about eleven and six o'clock.

CHOLERA ASIATICA.

The writer has had no experience whatever of this affection, and there is much difference of opinion, among those who have seen it, regarding the best treatment to be adopted. Only those general principles which have been most generally accepted need be detailed.

Opium, to stop purging, should be freely given, and it would seem obvious that it should be given in solution. It may be administered during the period of premonitory diarrhœa, and during the period of diarrhœa in the fully established malady, but should be withheld when collapse sets in; 15 to 20 minims of laudanum, with 3 grains of acetate of lead, may be given after each loose motion for four times, or dilute sulphuric acid may be freely given. A large mustard poultice should be applied over the surface of the abdomen. Hypodermics of morphine and atropine may be given to check the diarrhœa where vomiting occurs. Dr. Harkin has obtained good results by applying a blister over the course of the vagus in the neck. Ice in unlimited quantities may be given, and all liquids prohibited. If the diarrhœa continue, the opium may be cautiously pushed. It is, however, better to give the acetate of lead alone, dissolved in distilled water, to which a little vinegar is added; 2 grains may be given every hour, and the opium every two, three, or four hours as necessary. Should these efforts fail, 20 grains of calomel may be administered.

If collapse has set in, stimulants must be given in desperate cases freely. Friction and hot-water bottles to the surface of the body, and hypodermic injections of ammonia and camphor, and enemata of brandy and beef tea are used, if the bowels are quiet. Iced water may be freely given, and champagne often saves the patient until the reaction period sets in, after which all treatment should be eased off, and iced milk or arrowroot and enemata of beef tea given every four hours. Vomiting may be combated with creasote or carbolic acid (1 minim), copper sulphate (¼ grain), or turpentine.

Saline injections into the veins, or milk may be similarly employed

or injected into the peritoneal cavity in formidable collapse, and a hot bath may be administered in the cold stage. Oxygen inhalations have been credited with saving life.

Almost every new antiseptic is vaunted, until numerous trials prove it to be no better than the old agents. Salol is at present enjoying some reputation upon the strength of Lowenthal's statements and experiments.

The following is a good astringent formula which may be used to relieve the diarrhœa prevailing about the period of cholera epidemics:

℞.—Tinct. kino ℥iv.
Tinct. catechu comp. ℥v.
Tinct. opii ℥ij.
Spt. ætheris ℥iij.
Mist. cretæ ad ℥vj.—M.

S.—Take one tablespoonful after each liquid stool, the bottle having been first shaken.

CHOLERA INFANTUM—See Diarrhœa.

CHORDEE—See Gonorrhœa.

CHOREA.

Of the host of remedies recommended from time to time for the treatment of chorea, only three or four are of real value. A disease so liable to get well in many cases if left to itself is certain to have scores of specifics, and whatever drug the observer had chanced to give, he is liable to attribute the spontaneous cure to its influence. While many case of chorea will recover if left alone without any medicine whatever, it is equally certain that many will go on from bad to worse if not arrested. It is also certain that we have drugs which, if judiciously administered, possess the power of arresting the disease.

Rest in bed, suitable clothing, ventilation, cold sponging, good food, and abundance of it carefully administered, will go a great way to effect recovery. Rest in bed and freedom from all excitement is essential in all bad cases.

Often the condition is associated with anæmia, and when this is remedied the chorea passes off. It will be wise, when a mild case comes before the physician for the first time, at the very commencement of the symptoms to attend to rest and feeding, and abstain from very active drugging. A small quantity of tincture of iron, with cod-liver oil or malt extract, cannot fail to improve the general health when associated with a few mild doses of a saline purgative. If the movements, however, have lasted for any time—a week or more—the patient should at once be placed upon a course of arsenic. From a very extensive experience of chorea in a children's hospital, the

writer has thoroughly satisfied himself about the great value of the drug in this affection, and he is led to state that the cases of reported failure are generally owing to a mistake in the dosage.

Choreic children bear larger doses of arsenic than would at first sight seem possible. These large doses are also necessary to produce an effect upon the disease. Given in the ordinary doses, say of 1 minim of Fowler's solution for a child two or three years old, or of 2 or 3 minims for a child of six or seven, arsenic probably produces little or no benefit, and the writer has seen several cases where the drug was said to have failed, which have rapidly improved when the proper dose was administered. Something very like this is seen in the treatment of anæmia and chlorosis with small doses of iron. It is a well-established fact that these affections may be for a long time treated by ordinary doses of some iron preparation without any appreciable benefit, but almost immediately improvement is noticed after the administration of large doses—doses much larger than can possibly be assimilated. Thus Seguin gives up to 25 or 27 drops after each meal in a large tumblerful of alkaline water in divided drinks during the hour following the meals.

For a child of seven years old with choreic movements, Fowler's solution may be commenced in doses of 3 minims three times a day, and the dose may in a week be brought up to 10 minims three times daily without producing any untoward symptoms, and this dose can be taken for many weeks. Should improvement be very slow, the arsenic may be pushed until griping and indigestion or signs of irritation of the conjunctiva, or nasal mucous membrane show themselves. Iron may be combined with it, but not in doses proportionately large, and it should always be given after a full meal. The following is a good working formula:

℞.—Tinct. ferri chlor. ℥ij.
Liq. arsenicalis (Fowler) ℥iij.
Glycerini ℥j.
Aquæ destillatæ ad ℥v.—M.

S.—Take a teaspoonful, by measure, in water, three times a day, after meals.

In the great majority of cases no further treatment will be required. Next to arsenic comes sulphate of zinc. It is not safe to give out bottles containing large quantities of arsenic amongst the promiscuous crowds of the extern department of a children's hospital, and here it is well to have a remedy at hand which, if swallowed by mistake in large quantities, will not cause fatal results. Beginning with 2 or 3 grains, soon increased to 8 grains, the effects of sulphate of zinc are well marked, and it is rather surprising to see how soon the stomach becomes accustomed to large doses without producing nausea. It should be given in solution immediately after a meal, and four times a day. The sulphate of copper and nitrate and oxide of silver appear

to act in the same way, but they have no advantages over zinc salts, and are even more dangerous than the arsenic if swallowed in large quantities by mistake. Other remedies used occasionally with benefit are apomorphine, lobelia, and tartarated antimony, given in doses to produce nausea bordering upon vomiting.

Bromides of potassium, ammonium, sodium, and zinc in full doses to allay nerve excitement have proved useful, and Goubert gives the bromide of gold in doses of $\frac{1}{10}$ grain until sleep comes on.

Actæa racemosa, iodides, and salicylates, in cases where the attack has a more than ordinary association with acute rheumatism. The first-named remedy has been much praised, the writer believes without possessing any decided merits.

Phosphide of zinc ($\frac{1}{20}$ grain for a child seven years old) and the valerianate of zinc (in $\frac{3}{4}$ grain doses) act somewhat like the sulphate, but less satisfactorily. The oxide may be given in doses as large as the sulphate.

Strychnine was recommended highly by Trousseau, who gave it in gradually increasing doses until mild symptoms of poisoning began to show themselves. It is stated to be still the best remedy for chorea caused by a fright, but it is the writer's experience to find that a history of fright is to be found in very many cases of the disease.

In the very severe cases of acute chorea, threatening seriously to cut short the little patient's career from the exhaustion caused by the ceaseless movements of the limbs and body, a different set of remedies must be employed. Here, to wait for the action of zinc, arsenic, or iron is out of the question. It is in these comparatively rare cases that the remedy recommended by Harley is indicated. He gives conium juice in large doses until the physiological effects are observed. Ringer gave "to a child" 7 drachms of the juice every hour, unless when asleep. Unfortunately, the effect of the drug is not lasting, but the writer was able in one bad case to keep the child alive until arsenic had time to act.

Chloral is of the greatest use in these cases in gradually increasing doses. A child seven years old might be cautiously started upon 3 grain doses.

Gairdner mentions an interesting case in a girl aged eight, who was taking 15 grains three times daily. She then got 60 grains by mistake, and though her life was in great danger, she recovered, and the chorea was cured. He states that it has an almost absolute power of suspending or controlling spasm during the persistence of its deep hypnotic action.

Bastian has treated several cases by keeping the patient asleep for several weeks, except for half-hour intervals, during which she was fed. This appears to the writer to be a very questionable method of proceeding with a dangerous drug.

Chloralamide may be pushed with greater safety, and excellent results have followed its use.

Belladonna and hyoscyamus may be tried, and in a few cases cannabis indica has given rest; more frequently it is useless, or aggravates the symptoms all round.

In desperate cases the vapor of chloroform may be inhaled, and if sleep supervene without the cessation of movements, it may be continued at short intervals cautiously. Ether may be given. Antimony has occasionally given rest in these acute cases, but it interferes seriously with appetite and digestion, and it is of vital importance to sustain life by stimulants and good feeling.

Curara has been employed in doses of $\frac{1}{30}$ grain for a child hypodermically, and though it is doubtless a remedy of some value, its effects are very evanescent, and they cannot with safety be kept up for any length of time.

Physostigma in powder, extract, or alkaloid has been tried, and is open to the same objections as the previous remedy, so that upon the whole it is doubtful if its administration is justifiable; $\frac{1}{30}$ grain of physostigmine for a child seven years old may be given hypodermically every four hours, and Reiss claims that he cures chorea with eserine hypodermically in five or six days. His dose is $\frac{1}{10}$ grain twice daily.

Ether spray applied along the spine is not open to any objection, and sometimes produces refreshing rest in severe cases, and should always be tried. It is better than cold douches and the spinal ice-bag. Methyl chloride spray has been also used.

Morphine hypodermically may be given to induce sleep, but the greatest caution should be exercised in treating children in this way, and the writer would be slow to ever try it.

Sulphonal is perfectly safe, and may be given in full doses. Moreover, it has been given as a routine remedy for the disease with some show of success, even where sleeplessness was not a feature. As just mentioned, chloral or chloralamide may be resorted to when insomnia is present.

Cypripedium, the eclectic preparation from "ladies' slipper," has been given in doses of 1 grain every two hours to young children. Its reputation rests upon very slender evidence.

Antipyrine and antifebrin have been recently tried, both in the mild and grave forms of chorea, occasionally with marked success, and their effects may safely be tried where the better known remedies fail. With our present knowledge of their pharmacology and of the pathology of chorea we do not know beforehand the class of cases in which they will succeed. Antipyrine may be given in 2 grain doses every three hours to very young children.

Static electricity has been used, but its value has yet to be established. General galvanism has occasionally given good results, but the strong, interrupted currents recommended by some writers are not to be sanctioned.

Restraint of the excessive movements, when judiciously carried out by a skilful nurse, and proper bandaging of the upper limbs to the

trunk, and the lower extremity to each other, often gives some relief in the grave affection. Should it increase the patient's discomfort, it should not be persisted in.

Heart complications may require attention, but unless these be of old standing, it is not good practice to begin pouring in full doses of digitalis and strophanthus.

Cod-liver oil is useful at all stages of the disease, and during convalescence, when the movements have ceased, moderate exercise and limited gymnastics may be indulged in.

CHYLURIA

has yet to be satisfactorily treated. No remedy appears to possess any constant effect upon the appearance of suspended fatty matter in the urine, generally caused by the presence of filariæ in the blood and lymphatic vessels.

Benefit is obtained for a short time by decoctions of the bark of rhizophora racemosa (the mangrove), or preparations of the seed of nigella sativa. Stephen Mackenzie got promising results from benzoate of soda in drachm doses three times a day, but was unable to follow out the after-history of the cases. Gallic acid (in 1 to 2 drachm doses) always affords some benefits, and large doses of tinct. ferri chlor. do some good. Antiseptics have failed, but large doses of iodide of potassium appear to have checked the discharge for a time in several cases.

CHOROIDITIS,

if of syphilitic origin, will yield to active mercurial treatment, and if got at an early stage, mercurial inunctions are especially indicated, and should be continued for a considerable period. In acute cases occurring late in syphilis, large doses of iodide of potassium may be tried first. In acute or subacute cases, where sight has recently been failing from areolar or diffused choroiditis, where no history of syphilis is obtained, and where the kidneys are sound, the hope lies in small doses of the bichloride of mercury ($\frac{1}{15}$ grain four times a day), commenced after a brisk saline purgative. Bloodletting by leeching of the temples, followed by the application of a small cupping glass, or preferably by the use of Heurteloup's leech, should be at once resorted to, and any deviation from the standard of health attended to. Absolute rest to the eyes must be insisted upon. Pilocarpine hypodermically, in doses of $\frac{1}{6}$ to $\frac{1}{4}$ grain, is the best remedy where recently-effused products have to be dealt with. Where detachment of the retina, or of the retina and choroid together, has taken place, a small valvular puncture should be made in the sclerotic to provide for the evacuation of the sub-choroidal fluid and the replacement of the detached membrane. This treatment should be followed up by blistering or smart counter-irritation over the temples and behind the ears.

For the chronic disseminated choroiditis, chiefly observed in chil-

dren, the offspring of syphilitic parents, little or nothing can be done, unless there chance to be some recent or active inflammation going on. Generally the defect in vision is only noticed long after the active stage is passed, and when the period has expired during which treatment would be of any use. The necessity of treating every departure from the normal standard of health in such subjects need hardly be referred to.

CLEFT PALATE

can, of course, only be satisfactorily dealt with by an operation. As a rule, this should not be undertaken, in cases where the soft palate is alone involved, till the patient is past the period of the first dentition. About two and a half years of age is a good time. Where the hard palate is involved in the cleft, about double this age is the best period for operative interference.

The uvula being caught firmly with forceps, the margins of the cleft in the soft palate are carefully pared. Sutures being passed, the margins should be approximated. If there be much tension, an incision should be made a short distance outside the cleft on each side, and parallel with it, to allow of accurate adjustment of the pared edges without undue tightness of the sutures. Where the fissure extends to the hard palate, an attempt can at the same time be made to close it also.

The periosteum being dissected from the bone on each side of the margin of the cleft through incisions parallel to the cleft, and a little distance outside it, the edges of the muco-periosteum are sutured and brought into position, as in the case of the soft palate. If the gap be wide and tissue very valuable, the edges need not be pared, but simply everted; as the sutures are tied, the eversion secures the approximation of the raw upper surface of the flap. The most careful feeding and nursing are required. The sutures may be removed about the eighteenth day.

In cases where the condition has been neglected, and the patient first presents himself for the treatment of a cleft in the hard palate in adult life, the operation of Sir William Fergusson may be decided upon. But the writer would say, after witnessing Sir William perform the operation himself in 1874, that it should not be entered upon without serious consideration. The perforation, and subsequent chiselling and detachment of the segments of bone being a most protracted and bloody operation, and not always followed by success, and if success be achieved, one may well question "if the game be worth the candle."

Such a case may be made comfortable for the remainder of the patient's life by having a gold or thin vulcanite plate accurately adapted to the roof of the mouth, covering the fissure, and having an artificial tympanum or soft palate of India-rubber attached behind. The plate may carry any artificial teeth to fill gaps in the row of incisors, and it may be attached to the sound molars.

CLUB-FOOT.

The treatment of the different varieties of this affection is carried out by various surgical procedures, whose object is to overcome the contractions or shortenings in the muscles upon one aspect of the limb, while upon the elongated side of the affected leg or foot attempts should be made to increase the strength and tone of the muscles and other structures. Tenotomy will only be required in the severer forms of the deformity. If the foot can be easily brought into its natural position by flexion or extension without the use of any force, permanent removal of the deformity may be achieved by careful and frequent extension of the contracted tendons and massage of the weakened muscles upon the opposite aspect of the limb, carried out several times a day by a skilful nurse.

Where some force is requisite to get the foot into the normal anatomical position, and keep it there, it will be necessary to secure it in this position by strapping, so applied as to counteract the tension exercised by the shortened tendon. If the necessary force be greater than strapping will afford, a simple splint, with a moderetely firm bandage, may accomplish this.

Many paralytic cases of club-foot will yield to these measures, and the writer has had very satisfactory results by injecting small doses of strychnine into the weakened muscles in cases following poliomyelitis anterior acuta. Galvanism, a weak, interrupted current or a strong, continuous one, will sometimes restore power to muscles when they have apparently disappeared altogether, but the remedy must be persisted in for a long time.

In congenital cases the extension and massage should be commenced as soon as the affection is recognized. If these measures fail to produce decided improvement, or if the strong force required to bring the foot into its position, convinces the surgeon that these measures are inapplicable from the first, the contracted tendons should be divided with a tenotomy knife subcutaneously, and the foot in its deformed position should be bandaged to a splint for a few days to keep the divided ends of the tendon from separating. Gradual extension by means of a Scarpa's shoe may be commenced after some uniting material has been poured out between the cut ends of the tendon.

The different varieties of talipes will, of course, require division of different tendons when they fail to respond to simililar treatment, and the different examples of each variety may demand different operations, thus for equinus the tendo Achillis may only require division, whilst in another case the plantar fascia must be incised also.

The congenital equino-varus presents considerable difficulty in its treatment. It is best to remedy the varus, and afterward divide the tendo Achillis. The first object is achieved by tenotomy of the tibialis anticus, tibialis posticus, and flexor longus digitorum. After treatment by extension for five or six weeks, the plantar fascia and tendo Achillis are divided, and a suitable boot and appliance made by

an instrument-maker, adjusted to the limb, by means of which stretching of the contracted tendons may be kept up for many weeks, massage and passive movements being continued daily for months afterward. The other varieties of tallipes are treated upon the same general principles, always remembering that after tenotomy operations the mechanical stretching of the divided tendons must be kept for up a long time.

Ogston, relying upon the cause of club-foot being an arrest of the fœtal unwinding of the limb, which affects all the structures of the foot and leg, denounces as most unscientific the division of a tendon in its sheath "for no union between its divided ends is possible, and anything more useless in treating ordinary club-foot could scarcely be named. Promiscuous tenotomy is both unscientific and unnecessary." He approves of Hüter's method of keeping the limb in a rectified position (after manipulation by the hand under chloroform) by means of a fixed bandage of Cafferatas best plaster-of-Paris (as being better, because requiring less skill and patience than splints), elastic traction, and other apparatus.

The plaster splint is applied at about the age of six weeks, by means of book-muslin plaster bandages, applied *direct* to the skin, the limb being held in as near the normal position by plaster-loops until the bandage is applied, after which it is held until the plaster sets. He permits these to remain on for six weeks. The varus position should always be corrected before touching the equinus. For this he always divides the tendo Achillis, and applies the bandage from the foot to half-way up the thigh, with the knee extended. In older cases the choice lies between cuneiform exsection of the tarsus, linear osteotomy of the tarsus, or Lund's excision of the astragalus or osteotomy of the tibia or fibula.

COCCYDYNIA.

Sir James Simpson's operation of subcutaneous section of the coccygeal muscles is the only remedy for this most obstinate affection. Where this operation fails, Notts' practice of excising the coccyx will also generally be found to fail. Some relief may be obtained by wearing a belladonna plaster, cut to the shape of the parts, and terminating in a pointed end or tail. which covers the skin over the lower part of the sacrum and coccyx, coming forward to near the anus. Any local anæsthetic may be employed from time to time to give temporary relief, and occasionally benefit is derived from the application of a blister or counter-irritant, like the liniment of iodide, or Corrigan's iron.

The continuous current and the hypodermic injection of antipyrine may be tried. Any uterine or ovarian source of irritation should be closely looked out for, and codeine may be indicated as having, though less power to relieve than morphine, less danger of establishing the terrible opium habit.

Ménière uses the following suppository at bedtime:

℞.—Ext. belladonnæ gr. ¼.
Ext. hyoscyami gr. ¾.
Iodoformi gr. ¾.
Olei theobromatis gr. xx.—M.

Or,

℞.—Choral hydrat. gr. jss.
Ext. valerianæ gr. jss.
Olei theobromatis gr. xx.—M.

COLIC, Biliary—See Gall-stones.

COLIC, Intestinal.

The cause of the attack will often afford the best indication for the nature of the treatment required. Thus the colic of infancy generally depends upon an error in feeding, and in the majority of cases will be found to depend upon the presence of indigestible milk curd, which, if not speedily remedied, may give rise to rapidly fatal enteritis. A smart purge (1 or 2 drachms of castor oil), combined with carminatives and a change of diet, will give permanent relief. If the milk of the mother or a healthy wet nurse is not available, Nestlé's food is decidedly the saftest and nearest port in the storm in cases of severe, intractable colic in infants.

The minor attacks of infantile colic should never be treated by laudanum. The oil of anise, 2 to 3 drops on sugar, may be given every hour. Peppermint is more suitable for children and adults. Dill water, with a little magnesia, is a favorite domestic remedy.

℞.—Magnes. carb. gr. xx.
Syr. zingib. ʒiij.
Spt. chlorof. ♏ xx.
Aquæ anisi ad ʒij.—M.

S.—Take a teaspoonful every hour, if needed.

In adults, if the colic depends upon the presence of any irritating or indigestible or fermenting food, a smart purge, with opium combined, should be given. Castor oil is the safest of all cathartics in such cases, as there is always the remote possibility of some abdominal mischief lying behind the attack.

The following is a well-tried formula:

℞.—Ol. ricini ʒ vj.
Tinct. rhei aromat. ʒ ij.
Tinct. opii ♏ xx.
Aquæ cinnamomi ad ʒ ij.—M.

S.—To be taken immediately, the bottle having first been shaken.

6 grains of calomel, with $\frac{1}{6}$ grain of morphine, may be placed upon the tongue if vomiting is present, or $\frac{1}{2}$ grain of morphine may be given in suppository, after a large warm-water enema. Before the cathartic acts, the patient may be put in a hot bath (at 104°), and a large linseed and mustard poultice applied to the abdomen after he is put to bed. Hot turpentine stupes may be used instead of the bath. The ordinary India-rubber bottle, filled with hot water, and laid against the stomach region, affords great comfort in all cases.

Should the pain continue unrelieved, a hypodermic of $\frac{1}{3}$ grain of morphine, with 1 minim of the 1 : 100 solution of atropine, may be given in conjunction with a glassful of hot punch. Chloroform has been administered where the suffering has been acute, but in simple colic it must be seldom required. The following may be tried in chronic cases, or where the attacks recur:

Asafœtida—The tincture or fetid spirit in doses of 1 drachm.

Sal Volatile—In teaspoonful doses, largely diluted or combined with whiskey or brandy.

Ether—In teaspoonful doses of the spirit, or of Hoffman's anodyne, or even teaspoonful doses of the pure ether might be given alone, or in a little spirit.

Belladonna—20 minims of the tincture may be administered at one dose.

Ginger or Cardamoms—In teaspoonfuls of the tinctures diluted.

Essential Oils—Cajuput (5 minims), chamomile (3 minims), peppermint (5 minims), cinnamon, cloves, or caraway (3 minims), or camphor, 5 grains, every two or three hours.

Nux Vomica is much praised; the writer never saw it give relief.

Cocculus Indicus, from which picrotoxin is obtained, is said by Brunton to relieve colic in pregnancy. Each of the above will do likewise without any of the dangers attending the use of this drug.

Chlorodyne—15 to 30 minims is a popular remedy of great power and certainty of action.

COLIC, Lead.

A smart purgative should be given at once when the patient first comes under observation. 1 ounce of sulphate of magnesia is the most suitable. Castor oil acts satisfactorily, but the sulphate can be repeated every three hours in teaspoonful doses if the first dose fails to act, whilst repeated doses of oil cannot be tolerated. Should the pain be severe, any of the remedies mentioned upon the previous page may be administered with the view of giving temporary relief. After the evacuation of the bowels, the patient should be put upon a course of iodide of potassium to cause elimination of lead from the system. This course may be well supplemented by a morning purge caused by the sulphate of magnesia.

Diluted sulphuric acid, in 20 minim doses, may be taken in half a

tumblerful of water as a drink frequently during the day, or lemonade made with sulphuric acid instead of citric and tartaric acids, as ordinarily employed by lemonade makers. This beverage is a valuable prophylactic, and may be given with the iodide in bad cases.

Alum, in full doses, sometimes purges in the obstinate constipation of lead colic, and it is also said to relieve the pain when purging does not occur. It may be given in doses of 20 grains.

Sulphur, onions, garlic, eggs, Harrogate water, and other sulphur-containing bodies have been used successfully with a view of causing elimination. Sulphur baths have been recommended for the same reasons, and a diet of milk in large quantities favors convalescence. (See also under Plumbism.)

COLIC, Renal—See Stone in the Kidney.

COLLAPSE (and Shock).

The most obvious indication in the majority of cases of collapse, from whatever cause, is to attend to the condition of the heart. The horizontal position must be enforced, and the falling body-heat corrected promptly by warmth to the surface at every point with hot blankets, water bottles, and gentle friction. The cutaneous circulation, and, reflexly, the circulation in other parts, should be stimulated by mustard to the spine, nape of the neck, and calves of the legs. Brandy or whiskey punch should be given if the patient can swallow; if not, these remedies must be administered by the bowel or by hypodermic injection, though this latter method is very objectionable, owing to the bulk of the necessary amount of alcohol. Should the hypodermic method be the only available route in desperate cases, then ammonia (weak solution or sal volatile) should be injected under the skin or into a vein. Ether may be substituted with advantage.

Digitalis, strychnine, strophanthus, belladonna, and cardiac stimulants of this class are employed, but their action is too slow to be relied upon in emergencies. Ammonia to the nostrils is a much better remedy. Electricity may be applied to the phrenic nerve, or an interrupted current may be sent through the upper extremities. Liebig's extract in large doses with hot water, is a rapidly acting stimulant.

Should the collapse or shock be associated with extensive hemorrhage, subcutaneous injections of warm saline solution, or transfusion, may be performed (see page 37); or a temporary ligature or tight bandage may be applied to the thighs to prevent the blood entering the lower extremities; or, what is much better, an Esmarch's elastic bandage to the limbs, or a tourniquet applied to the femoral artery may be tried.

If a serious operation must be performed, unless there be hemor-

rhage going on, the surgeon should wait until reaction symptoms are positively established, but he should not wait too long. If he operate during the stage of acute collapse, death will probably ensue, while, if the operation be performed after the establishment of complete reaction, the shock of the operation may cause a fatal second collapse. (See Syncope and Concussion.)

COMA.

Treatment is useless unless the physician can form some idea of the cause of the coma or deep stupor. Thus a head injury, meningeal inflammation, apoplexy, sunstroke, opium or alcohol poisoning, uræmia, or hyperpyrexia may be the cause, and should be promptly met by the treatment as detailed under the heading of the individual primary affection.

Thus the large dose of calomel given to an apoplectic patient, may cause the death of a patient seized with coma from diseased kidney if administered to him. To treat the coma of opium as one would treat the profound unconsciousness caused by hyperpyrexia, would be to allow the patient to speedily pass beyond the reach of remedies.

Where no evidence whatever can be obtained of the cause of the coma, say, in a subject picked up in the streets, sinapisms may be applied to the back of the neck, spine, abdomen, or back of the legs. If there be even a suspicion of poisoning, the soft tube of the stomach pump should be passed, and the contents drawn off and examined. No harm can come from such procedure, while, should the patient die without this having been done, and subsequent information be forthcoming at the coroner's court, serious blame will be meted out to the attendant, even though pumping would have been useless. The writer has often got valuable information by using the catheter in such cases and examining the urine drawn off.

A smart purgative—one drop of croton oil—is the safest and can do no harm; often the cold douche may be used. (See the treatment of each of the primary affections under its own heading, *i. e.*, Apoplexy, Uræmia, Poisoning by Opium, Alcohol, etc.)

CONCUSSION.

The treatment of the condition spoken of as concussion of the brain, may be best managed by carrying out the suggestions made under the head of Collapse. The violent shaking, causing the shock to the patient's nervous system, is best met by absolute rest and quiet. Stimulants should not be given unless the collapse be very alarming. If reaction be ushered in by a hot skin, flushed face, and diminished pupils, ice to the shaven head, a smart purge, a darkened room, and complete rest for two or three weeks will be advisable. (See Collapse.)

CONDYLOMATA.

Cleanliness, and the free pencilling over of the patches with solid argent. nit., or the acid nitrate of mercury solution, and afterward dusting with dry calomel, is the best treatment for the troublesome growths.

Chromic acid (1 to 5 of water) speedily destroys mucous patches in the mouth and on the tonsils; it must, however, be used sparingly, as its poisonous effects, when absorbed, are well known.

Iodoform may be freely dusted upon those appearing on the vulva and about the anus, or wherever there is much moisture.

Nitric and carbolic acids may be used as caustics, while the strongest zinc chloride solution will rapidly destroy external patches, and a weak lotion of the same (10 grains to 1 ounce) makes a good astringent dressing for after-treatment.

The non-specific patches of long standing may be freely cut off with a knife or scissors after the appplication of the ether spray, and a subsequent application of any strong caustic will stop all hemorrhage, and destroys anything left by the cutting instrument.

CONJUNCTIVITIS.

The milder and more common form of simple or catarrhal conjunctivitis is best treated by any mild astringent lotion, as

℞.—Zinci sulphatis gr. x.
Aquæ rosæ ℥viij.

Or,

℞.—Acid. borici gr. xxxv.
Aquæ rosæ ℥viij.

Or,

℞.—Aluminis sulphatis ℥j.
Aquæ destil. ℥x.

Or,

℞.—Zinci chloridi gr. iv.
Aquæ destil. ℥viij.

Or,

℞.—Hydrarg. bichlor. gr. j.
Aquæ distil. ℥viij.

Or,

℞.—Argenti nitratis gr. v. to xx.
Aquæ distil. ℥viij.

These lotions can be best applied directly to the conjunctiva by the small douche glass made to fit to the margins of the orbit, and half filled with the solution; by nodding the head, the conjunctival sac is thorougly cleansed, and if the lids are kept open every part is brought into contact with the remedy. A very short course of this treatment

is generally sufficient. Pain and photophobia may be relieved by iced compresses, and the instillation of atropine or cocaine. When the case does not yield in a few days to astringents, the lids should be everted and the whole conjunctiva brushed over with the nitrate of silver solution; after applying this latter (10 grains to 1 ounce) the surface should be rapidly swabbed with solution of chloride of sodium. It should be remembered that this form of the affection is highly contagious, and the most careful isolation is necessary sometimes to prevent it spreading in schools. Towels, basins, soap, brushes, etc., should be carefully cleansed before being used by children free from the disease. The writer has quite recently seen a large school of young children affected in this way.

Strumous Ophthalmia is the name by which an affection like the above is known when it attacks scrofulous and badly cared-for children. Generally phlyctenular ulcers exist, and there is much redness, swelling, pain, and photophobia. Atropine gives great relief in most cases, though it sometimes aggravates. The use of any of the astringent lotions already mentioned would do good, but it is often impossible to get the little patients to tolerate their application.

Pagenstecher's ointment—30 grains of yellow oxide of mercury to 1 ounce of vaseline—should be smeared across the margin of the slightly everted lid. Half the ordinary strength of this ointment is better, and the writer has seen best results from it when made of the strength of 8 grain to 1 ounce.

Like all eye ointments, if not carefully rubbed smooth, the coarse particles will do harm by increasing irritation. For this and the previous form of conjunctivitis dry calomel dusted into the eye with a camel's hair brush generally gives splendid results. It should be continued for a considerable time after the disappearance of all mischief.

The constitutional treatment for struma should be actively undertaken—good feeding, open-air exercise, cod-liver oil—and the eyes should not be bandaged or shaded except in strongest light. If corneal mischief results, appropriate treatment should be at once commenced. (See Cornea, Inflammation of.)

Ophthalmia Neonatorum.—Hourly washing of the eye by a small stream of weak astringent lotion, allowed to fall between the opened lids from a small piece of good sponge or piece of lint, will soon cut short the disease. Two nurses sit down on chairs facing each other. One takes the child and places it on its back, with the head resting upon the knees of the opposite nurse, who opens the lid with the fingers of her left hand, while she squeezes the lotion from the bit of sponge, allowing it to fall in a small stream upon the conjunctiva.

If there be no abrasion or ulceration, by far the safest remedy to put into the hands of the nurse is a weak solution of alum (8 grains to 1 ounce), and though it is said to act as a solvent to the corneal cement, the writer has never seen it do the slightest harm in the large practice of a children's hospital. Zinc sulphate (1 grain to 1 ounce)

or any of the previously mentioned lotions may be used. Weak carbolic acid (2 grains to 1 ounce) does very well, and also corrosive sublimate solution (1 : 6000).

Another excellent plan of treatment in cases of some severity is to wash out the eye, as just described, with a stream of water, and then with a large soft camel's hair pencil swab over the inflamed conjunctiva with a solution of nitrate of silver (2 grains to 1 ounce) every four hours. The lids should be smeared with vaseline iodoform ointment (1 : 20) along their margins, to prevent their adhering together.

If there be great swelling and congestion, the conjunctiva should be once or twice swabbed over (when the lids are thoroughly everted) with a strong solution (15 grains to 1 ounce) of nitrate of silver, or the mitigated stick may be cautiously applied. Compresses soaked in iced water should be continually applied in severe cases.

Crédé advises that a drop of a solution of the nitrate of silver (10 grains to 1 ounce) should be put into the eyes of all children immediately after birth as a preventive. The disease spreads from one infant to another.

Scrupulous cleanliness is all that is necessary. It seems certain that the infection, except in some cases of face presentation, cannot occur in the vagina, but afterward. The face of the child should be washed with a different sponge and water from that used for the body. Atropine should be used along with the caustic when there is any opacity of the cornea to be noticed. When the secretion gets thin, reduce the strength of the nitrate of silver solution. Eserine should always be resorted to when ulceration of the cornea takes place.

Ophthalmia, Purulent.—Including under this head cases of the previous variety which have gone on from bad to worse until a free discharge of pus flows from the conjunctival membrane, and including also the severe and dangerous cases caused by the inoculation of gonorrhœal matter into the eye, the treatment is to be conducted upon the lines already mentioned, only stronger solutions must be used. After washing the secretion off the membrane, the lids should be thoroughly everted and brushed over with a very strong solution of the nitrate of silver (20 grains to 1 ounce), and a little solution of common salt immediately dropped upon the surface to neutralize the caustic. Or the solid stick of mitigated caustic B. P. may be lightly applied, and some solution of salt dropped on afterward. Iced compresses should be applied, and the caustic application renewed again at the expiration of twenty-four hours. If the ulceration of the cornea has already taken place, the same treatment will benefit it. The other eye, if sound, should be most carefully guarded against the possibility of inoculation, by bandaging over a pad of cotton wool, or in the case of infants by sealing the lids with collodion. In milder cases, instead of applying the caustic twice or oftener, the surface of the inflamed membrane may be dusted over with very finely powdered iodoform, or

if there are reasons against the use of caustics, solution of bicarb. soda (30 grains to 1 ounce) may be tried.

Excellent results are reported by H. Jones and E. Browne, by the plan of prolonged irrigation of the *whole* of the conjunctiva with a half per cent. solution of trichlor-phenolate of magnesium, with an irrigating reservoir. Panas' solution of biniodide of mercury was used in the same way, and caused less smarting and gave as good results. An ordinary Eustachian catheter can be substituted for the irrigating lid retractor.

Croupous Ophthalmia is best treated by frequent washing out with solution of boric acid (20 grains to 1 ounce), or better still by repeated applications of solution of zinc chloride (4 grains to 1 ounce), or corrosive sublimate ($\frac{1}{4}$ grain to 1 ounce).

Diphtheritic Conjunctivitis in the early stage must be met by vigorous constitutional treatment (see Diphtheria). After the establishment of purulent discharge in the second stage the caustic remedies mentioned under Purulent Ophthalmia may be most cautiously used, but caustics in the first or hot stage are to be condemned, then iced or hot fomentations are alone admissible.

Granular Ophthalmia, Conjunctivitis, or Trachoma.—The cause of the affection should be removed. Thus, overcrowding, want of cleanliness, smoky atmospheres, low-lying and damp habitations all tend to produce the disease.

The discovery of a microbe, which accounts for the marked contagiousness of the affection, suggests treatment by remedies fatal to germ life. Solution of bichloride of mercury (1 grain to 1 ounce) may be freely applied with a brush, and no further treatment will be required in mild acute cases save cold compresses to relieve pain, and darkened glasses to shade the light.

When purulent inflammation sets in, the indications for treatment will be mild astringent lotions used every few hours, and should the discharge continue, the treatment recommended for purulent ophthalmia must be employed.

In the chronic form of the disease the treatment will be to cause removal of the so-called granulations before destruction of the underlying membrane takes place This is best done by exciting a mild inflammatory action with caustics. A large crystal of sulphate of copper, rubbed into a suitable form, should be applied to the affected membrane. This very old-fashioned treatment is perhaps the most satisfactory of all methods of dealing with the chronic affection. It is better than nitrate of silver, which cannot be applied by the patient or nurse, and which is apt to cause staining, the application of the solid sulphate being, upon the other hand, easy and free from danger. Its use should not, however, be too long continued. It is a good plan to suspend its action for a time, and apply the solid mitigated caustic, followed by salt solution occasionally.

In very obstinate cases cocaine may be applied, and the granular

membrane scarified before applying the copper sulphate. Failing by all these methods, surgeons have been led to produce a purulent ophthalmia by inoculating the matter from the eye of an infant suffering from ophthalmia neonatorum, or by the instillation of fresh jequirity infusion (1 per cent.). The first method is obviously objectionable.

The second, though followed generally by a violent inflammatory action which clears off the old disease and any pannus present, may leave the eye greatly improved, nevertheless, since the inflammatory action sometimes cannot be controlled and destroys deeper structures, its use should only be attempted by a specialist of experience when there is much pannus present without corneal ulceration. In this latter case, curetting of the cornea acts very well. The same remark applies to the operation of removing the granulations by electrolysis, or by excision or abscission.

At the different stages of the treatment, the ointment of the yellow oxide of mercury, 30 grains to 1 ounce, may with benefit be applied in most cases; the red oxide does better sometimes. Corrosive sublimate solution may be used while the copper is suspended. This should be resumed as soon as the granulations became pale and flabby. Arnauts relies almost entirely upon the corrosive sublimate even in very old chronic cases, and he prefers it to all other agents, including copper, silver, and other astringents and caustics, and his opinion is supported by that of many others. He finds the corneal vascularity so rapidly disappears, that he thinks there must be some special action of the drug upon the newly formed vessels. Twice a week, after cocaine, the conjunctival surface of the lids is brushed with a 1 : 100 or 1 : 120 solution of corrosive sublimate, whilst a few drops of a 1 : 500 solution are to be dropped into the eye three times daily. Any little pain from these drops passes off in a few minutes.

Darier objects to the time taken up by these methods, and he therefore aims at a speedier removal of the *trachom-coccus* by the following steps of a radical operation which he has recently devised: (1) Anæsthesia by chloroform; (2) enlargement of the palpebral fissure; (3) exposure of the entire sac by everting the lids; (4) scarification of the conjunctiva by deep incisions parallel to the margin of the lids; (5) scraping with a Volkmann's spoon; (6) brushing in with a hard brush a solution of corrosive sublimate, 1 grain to 1 ounce.

CONSTIPATION.

If the physician can clearly determine the cause of the failure of the bowel to act, and if this cause has not been long in operation, its removal may often effect a complete and lasting cure. Thus in the case of a person confined within a limited space from morning till night without open-air exercise, it is surprising to see the effect which will generally follow a smart walk into the open air, especially in young subjects. Perhaps of all the causes of constipation, none is so constantly

present as the state of blunted sensibility which gradually but certainly follows neglected calls to evacuate. This cause must be ever on the increase as the high pressure of modern life promises fair to remain a gradually increasing quantity. The importance of some engagement or occupation causes the patient to control the desire to relieve the bowel till a more convenient moment, and three things happen:

1. The nerves of the rectum soon become less sensitive to the stimulus caused by the presence of the feces, and, if the disregard to the stimulus becomes a habit, the nerves fail to telegraph after a time.

2. The rectum becomes dilated, and its muscular fibres weakened.

3. The feces, remaining in the rectum longer than they should, undergo changes owing to absorption, and they become dry and hard, and more difficult of expulsion.

The treatment here indicated is to impress upon the patient the necessity of going to the closet at a certain fixed hour every day and by patience and artificial means to get the bowel into the habit of emptying itself daily. The experience of nearly every one points to the time immediately after breakfast as being the most suitable. It is a common error for the physician to direct a patient to go to the closet and strain or bear down from day to day till his efforts are rewarded by a painless evacuation. There are various grave reasons why this should not be encouraged to an undue extent; hæmorrhoids, prolapsus, and fissures are constantly the result.

Owing to the formation of the ordinary water-closet seat, each attempt at bearing down drives the pelvis tighter into the circular aperture of the seat, the bevelled sides of the opening also acting as an inclined plane, and the result is that the skin and mucous membrane around the anus become stretched to such an extent that cracks and fissures are formed, and the writer has satisfied himself that the brittle and unhealthy state of the integument observed in this region is owing to this stretching, which is often the starting point of prurigo and eczematous distress.

The modern fashion, originating in the sense of comfort and ease, should be corrected by the substitution of an aperture of different shape, and very much larger.

Evacuation should be artificially assisted by enemata or other means for several mornings, until the bowel begins to show signs of responding at the fixed hour. A cold water enema of about a tumblerful, injected while in the standing posture, so as only to reach the lower part of the rectum, is the best method of starting the intestinal tube to contract. Glycerin, in doses of a teaspoonful or less, injected with a syringe made for the purpose, acts powerfully by stimulating the membrane, but its present popular professional reputation as a remedy for constipation rests altogether upon a misconception of its advantages. By its powerful stimulation of the coats of the rectum (partly through its hygroscopic property), it ultimately blunts the sensibility of the

rectal nerve filaments to smaller stimuli, and if solely relied upon the end will be worse than the beginning.

Its value seems to be clearly like that of most purgative remedies; it is of use in tiding over constipation until other means have time to act. The enema may be substituted by a glycerin suppository, which acts equally well.

These suppositories afford, perhaps, the most convenient of all known methods of overcoming temporary constipation. Often within five minutes, and sometimes immediately, a copious and painless motion may be experienced after their introduction, and in affections like typhus or typhoid fever their action leaves nothing whatever to be desired. In hæmorrhoidal conditions and in cases of anal fissure, however, their use sometimes may bring on a very acute attack of pain and tenesmus. The glycerin soap suppositories act well, but the writer has generally obtained all the advantages claimed for glycerin by inserting within the internal sphincter a piece of ordinary soap shaped with the knife to suit the purpose, and this he has tried in cases of anal ulcer without any ill effects whatever, save momentary smarting. Both these plans, glycerin and soap, do splendidly with children.

Should there already be accumulations of feces in the rectum and colon for some time, they must be removed, and for this purpose ordinary purgation by the mouth is not to be thought of. A tepid water enema should be given when the patient is lying upon the left side, with the view of getting the fluid beyond accumulation; two or three quarts, if slowly thrown up, are safe, and generally effectual.

Castor or olive oil may be administered along with the water with great advantage. It is useless to pour the oil into the water, where it floats, and is not injected into the bowel till the very last. The nurse should lift the end of the enema pipe (lying in the water), and put it into a cupful of the oil, and continue the operation as before without the removal of the other end from the rectum. After pumping up 3 or 4 ounces or more in this way the end of the pipe is taken out of the oil and dropped into warm water again, and the pumping gently continued till the patient cannot tolerate the introduction of any more fluid, when the motion will occur. To remove lodgments from the colon several enemata may be required, and should the mass be above the reach of the finger, weeks may be spent in pumping it out, though this is decidedly exceptional. Should the mass be low down it may be broken up with the handle of a spoon or scoop, and removed piecemeal. Injections of oils, gruel, white of eggs, linseed infusion, and various other emollients are used. Recently a writer urges that brewer's yeast, when injected, breaks up, and causes the rapid disintegration of the impaction, and as it is harmless it should have a trial.

Electricity has been recommended by Hammond, who introduces the negative electrode within the sphincter for the treatment of chronic constipation.

An apparently similar line of treatment is that used by Cleveland,

who forcibly stretches the sphincter. This causes it to offer only passive resistance to the feces passing from the colon, while it closes sufficiently to check involuntary defecation.

Having then got the intestinal tract cleared in a case of chronic constipation, the physician's next attempt is to assist the patient in having a daily evacuation of the bowels, or if an evacuation every second day has been the patient's life long habit when in health, the effort should be to restore this habit, and not to attempt to improve upon nature.

Much can be done, as already suggested, by urging the patient to take a morning open-air walk if his habits have been sedentary. Unfortunately, in many instances, the class of patients to whom this would be valuable have little opportunity for walking, and the haste to reach their offices in the city only permits them to indulge in their usual omnibus or railway trip. To such, a half-hour's tricycle ride will be followed by splendid results.

Much can be done by diet. It is generally the small eater or spare liver who is the victim of chronic constipation, and often if such a one, from any cause begins to eat almost any sort of food in larger quantity than is necessary for the maintenance of health, the constipation disappears. In prescribing a dietary, foods which leave a bulky residue should have the preference. Brown bread, whole-meal bread, or any of the valuable bran breadstuffs placed within the reach of every one by the various food reform organizations are of great use. Oaten meal made into porridge, and taken at bedtime or before the ordinary breakfast, is the remedy which keeps many folk in health for years.

Vegetables and ripe fruit should be taken freely, and an orange eaten in the morning while dressing, answers well in some cases. There is nothing better than a good supper of boiled Spanish onion, and the writer has treated obstinate cases of constipation by this means alone, with very satisfactory results.

To patients who can bear a good sized spoonful of pure olive (salad) oil every morning after breakfast, it is a valuable laxative and food. The writer has noticed that it is not well borne by the plethoric, or by lean folk with dark skins. The pale washy-looking, blue-eyed, sedentary, thin subject gets much benefit from it or from cod-liver oil when taken once a day in one large dose.

Figs and prunes are serviceable, but even children grow weary of their lusciousness. Stewed prunes do well for a short time.

It is often a good thing to advise the patient to become a vegetarian for a time, and if he takes to the practice and makes a "fad" of it, his constipation, as a rule, disappears.

A diet consisting largely of boiled eggs, is sometimes the cause of the most obstinate constipation and accumulation of feces.

The Matlock system of wearing a cold water compress over the abdomen in the morning is of use, and massage or kneading of the

abdominal muscles may be tried in very sluggish subjects, or even smart friction over the abdominal walls with a coarse, warm towel for five minutes on rising, followed by a large drink of cold water and a smart cold shower or plunge bath, may do more good than medicines.

Electricity—a weak continuous current, with one pole on the spine and a large wash leather or sponge electrode moved about over the lumbar and hypochondriac regions, or a smart interrupted current may be used with advantage in the same way. A method of effecting the emptying of the colon by electricity has already been mentioned, but the writer would be slow to try it.

By a careful attention to the above methods, the physician will find that most of the cases of chronic constipation will be successfully combated without having to resort to the long list of purgatives in daily use. As a rule, active purgation should not be permitted, and, in many of the cases seeking relief, continual purgation indulged in for fancied ills will be found to be the cause of the constipation.

To increase the muscular and nervous tone of the bowel, and, at the same time, to increase the intestinal secretion so as to bring the motions to a healthy state of consistence, should be the objects aimed at in the treatment of chronic constipation with drugs.

Of the selection of purgatives there seems to be practically no end, and only a brief reference to the most valuable can be attempted.

Cascara sagrada, the comparatively new remedy, comes first in value, and when all the dietetic and previously-mentioned plans have failed, the patient should be placed upon small doses of the liquid extract. It may be given in various ways. One moderate dose at bed-time, the treatment not to be commenced till the existing constipation is for the moment corrected by some brisk purgative, is the most successful plan. Beginning with a nightly dose of 30 minims, in a few days the physician will obtain some idea of the dose suitable to the individual case, and the initial quantity is increased or diminished accordingly.

The object to be clearly aimed at is to avoid purgation, and to give the remedy in such a dose as wall secure one soft, natural motion every morning. The amount necessary to produce this result varies widely in different individuals, and in the same individuals at different seasons of the year.

There is the greatest difficulty in getting patients to graduate the dose themselves, and after a few weeks they stop the cascara altogether, through carelessness, or a belief that they are cured of the constipation and when the bowels return to their old habit, a large dose or cascara is taken as a purge. This is certain to be followed by worse constipation, and thus the remedy is set down as useless. The physician should be prepared for this, and should insist upon a two months' course at the very beginning of the treatment.

Another method is to give the cascara three times a day, after meals, in a dose equivalent to about one-third of the nightly dose. Thus, 10

minims may be given immediately after breakfast, luncheon, and dinner.

No matter which plan be adopted, after a few weeks the dose should be gradually diminished, still, however, taking enough to produce the healthy, natural morning motion, as if no purgative had been administered. At the end of a period, varying much in different cases, the remedy may be occasionally suspended for one day, and finally, in a few months in some cases, it may be permanently stopped.

The cascara may be given alone, or combined with some of the remedies about to be mentioned.

The B. P. C. cordial or elixir (1 : 2½) is a very good preparation in doses of about 1 teaspoonful. The fluid extract may be given with the fluid extract of liquorice.

The writer prefers the following:

℞.—Ext. cascaræ sagradæ fld. ℥ij.
Tinct. nucis vomicæ ʒiij.
Tinct. belladonnæ fol. ʒiij.
Glycerini q. s. ad ℥iv.—M.

S.—Take a teaspoonful every night and morning for four days then every night.

Sometimes the cascara is given before meals, and capsules containing any requisite dose may be had easily from any chemist, but, though elegant and effective, the dose cannot be easily regulated when the capsular form is used. The pilular extract may be given, but the fluid is more certain and uniform in its action. A new *tasteless* fluid extract is now prepared, and it is said that the extraction of the bitter substance in no way interferes with its efficacy.

Aloes comes next to cascara in value in the treatment of chronic constipation, and it is possible, in some years hence, that it may regain its old position at the head of the list. Like its newer rival, if judiciously administered, the dose need not be increased, while, in many cases, it may be diminished, and finally withdrawn as the constipated habit becomes cured. It is best given in combination with other laxatives or cathartics as it is slow in its action, and, when given in small doses, does not soften the motions much, but stimulates the peristaltic movement. It is a tonic, and very markedly increases the quantity of the biliary secretion.

Its action in chronic constipation is very materially increased by combining with it sulphate of iron, and Dr. Spender's famous pill is a splendid combination.

℞.—Ext. aloes aq. gr. j.
Ferri sulphatis gr. ij.—M.
Fiat pilula. (Make 50 of such pills.)

S.—Take one three times a day for seven days, then one twice a day for a fortnight, then one every night.

If the constipation be associated with amenorrhœa, the combination of aloes with iron is the best possible treatment.

Much conflicting opinion has been given about aloes in the treatment of constipation when associated with hæmorrhoids, and the matter may be safely disposed of in this way: Large purgative doses of aloes often seriously aggravate hæmorrhoids when present, while small laxative doses generally relieve and produce decided curative effects; and good results have been obtained by excellent authorities who treat hæmorrhoids exclusively by small doses (1 grain) of the extract of aloes given night and morning.

The compound decoction of aloes is a most unsatisfactory laxative in chronic constipation, and though of the greatest value in other intestinal disorders, it is not to be depended upon, as it is almost impossible to regulate the dose so as to produce uniform results, and frequently it causes constipation. (See fifth edition of *Pharmacy, Materia Medica, and Therapeutics*, page 354.)

The best results with aloes are obtained by the old-fashioned dinner pills, in which a small dose of aloes is combined with iron, ipecacuanha, capsicum, nux vomica, myrrh. belladonna, or hyoscyamus, and given immediately before or after dinner.

The following is an excellent combination:

℞.—Ext. aloes soc. gr. ss.
Ext. nucis vomicæ gr. ss.
Pulv. ipecac. gr. ss.
Pulv. capsici gr. j.—M.
Fiat pilula. (Make 24 of these pills.)
S.—Take one each day after dinner.

Sir Andrew Clarke uses this formula:

℞.—Ext. nucis vomicæ, Ferri sulphatis, Pulv. myrrhæ, Pulv. saponis, Aloin āā gr. ss.—M.
Fiat pilula.

The quantity of aloin is to be increased or diminished according to the effect produced upon the bowel.

Owing to the length of time aloes takes in acting, it is a mistake to give small doses at bed-hour, because they will produce no effect upon the morning evacuation.

Trousseau found the best results in the treatment of chronic constipation to follow the administration of

Belladonna. The *green* extract in doses of ¼ to ½ grain given at bedtime, alone or with as much extract of nux vomica, may be

tried, or belladonna may be given with any laxative in a dinner pill, when it will not only strengthen the muscular contractions of the bowel, but will to some extent prevent griping. The tincture, in small doses, is a very excellent treatment for the constipation of infants and children.

Colocynth, in small doses, is a valuable remedy, and the best preparation is the Prussian pharmacopœial tincture, in doses of 10 minims after dinner or a larger dose at bedtime. The compound extract may be given as a dinner pill in doses of 2 grains. A valuable combination is the following:

℞.—Ext. colocynth. comp. gr. xxv.
Ferri arsen. gr. j.
Ext. belladon. gr. viij.—M.
Divide in pil. no. xx.
S.—One after dinner.

In a few weeks the colocynth is to be diminished by one-half, and in a few weeks more it may be omitted altogether, and extract of nux vomica put in its stead.

Rhubarb, though much used and often swallowed for many years by constantly constipated patients, is not a good remedy. In the writer's experience its tendency in chronic constipation is not curative, and the reason why so many old folk stick to it is because once they get into the way of using it they cannot well do without it.

Podophyllin is much more valuable in the treatment of acute constipation where a satisfactory brisk purge is required, nevertheless it is useful in the chronic constipation of bilious subjects, and Quinlan speaks highly of the drug in the treatment of this condition. It may be very advantageously given in combination with belladonna.

℞.—Ext. podophyl. fld. ʒvj.
Tinct. belladon. ʒiv.
Tinct. zingiberis ʒvj.—M.
S.—Take twenty drops every night with a little sugar.

Nothnagel recommends the following formula as a laxative in chronic sluggishness of the bowel:

℞.—Podophylli resinæ gr. ivss.
Ext. aloes aq. gr. xlv.
Ext. rhei. gr. xlv.
Ext. taraxaci q. s.—M.
Divide in pil. no. xl.
S.—One, two, or three at bedtime.

Euonymin in pilular form acts much in the same way.

Castor oil, in small doses, has been given for long periods with advantage. Thus in the chronic constipation of pregnancy it is the best remedy in morning doses not exceeding one drachm, and may be taken with impunity all through.

Saline purgative waters, as Friedrichshall, Carlsbad, Hunyadi Janos, Pullna, etc., are very valuable as occasional adjuncts to the aloes or cascara treatment, and they are invaluable in the management of occasional constipation, but unless the above rational line of treatment by small laxative doses fail, their constant use is not likely to be followed by cure of the ailment if of long standing. The Friedrichshall is the best, and should be given in wine-glassful doses with warm water early in the morning before getting up. There is no better drug than this at the beginning of a course of treatment for chronic constipation, and its *occasional* morning administration, following aloes or cascara given the previous day, is attended with excellent results.

Senna, jalap, scammony, gamboge, croton oil, epsom salt, and mercurials are not available for the treatment of chronic, though valuable for the relief of acute or occasional constipation.

Tamar indien is an excellent remedy, and when administered with care to regulate the dose, is a very successful method of treating chronic constipation in patients whose feeble health or chronic ailments confine them to the house for the greater part of the year. It produces very large, almost solid motions, and its action is not followed by any tendency to constipation, and the dose can be easily diminished by the patient.

Sulphur is a good drug for the relief of chronic constipation, and may be given in the morning before breakfast mixed with a spoonful of orange marmalade, and the compound powder of liquorice is a palatable laxative for children.

Alum has been used as a remedy for chronic sluggishness of the bowels, and it is, doubtless, of great value in the constipation of lead colic; but, from its very marked astringent effect, the writer would be very slow to continue its use in ordinary cases of habitual constipation. It has been given in 3 grain doses with as much bismuth in pilular form.

Cocculus, guaiacum, muscarine, physostigma, stillingia, hydrastis, many eclectic remedies as baptisin and iridin, collinsonia canadensis, and many other cathartics have been, from time to time, used with some advantage in the treatment of chronic constipation. The writer has never felt called upon to use any of them, as he always found the condition to yield to the older and better known remedies.

For the constipation of children, many of the previously mentioned drugs are not suitable. In infants, the cause of the constipation, when it exists, is generally bad feeding, and it generally disappears when this error is corrected, The best drug for infants and young children is castor oil, and a daily very small dose—half a teaspoonful—generally

removes the condition. The writer has given cascara to young children with very obstinate bowels, with very satisfactory results; 5 minims of the fluid extract may be given every night, and the dose regulated as in the case of adults.

Glycerin suppositories, containing 90 per cent. pure glycerin, when inserted into the rectum, act with great promptness and thoroughness. Ordinary injection of 20 minims of glycerin acts satisfactorily, and may be used daily. This remedy is not objectionable in the case of very young children, as the writer thinks that the act of evacuation in them is more dependent upon the state of the great intestine higher up than the rectum, and the fact of accustoming the rectum to a smart stimulus from day to day, does not appear to blunt its sensibility so as to interfere with the act of defecation after the injections are stopped, as appears to be the result in adults.

Soap suppositories, made by cutting a small fragment of hard soap into conoidal form, and inserting it into the rectum, act also very well.

Compound liquorice powder, or 2 to 5 grain doses of sulphur, may be given for considerable periods with advantage.

Manna is a safe laxative for very young children, and may be given freely for a long time till the constipated habit disappears.

Injections of tepid water, 5 to 10 ounces, may be given occasionally to young children, and 3 to 6 ounces in cases of congenital constipation. It is needless to say that in these cases a very careful examination of the anus and rectum is essential when the bowels remain obstinate for any length of time in infants or very young children.

To acute attacks of constipation occurring in a person otherwise healthy, and where there is no abdominal obstruction, it will be seen that the foregoing remarks do not apply, and the treatment for such attacks is a smart purge. Any of the remedies already mentioned may be given in large doses. The old-fashioned method is the best, of giving at night a combination of cathartics, whose slow action upon different parts of the intestinal tube is "overtaken" by a smart dose of a saline early in the morning. Thus, 5 grains of mass. hydrarg. and 5 grains of ext. colocynth. comp., taken at bed-hour, and 2 ounces of black draught early in the morning, is a very efficient purge for robust men.

It must not be forgotten that diarrhœa is sometimes, especially in elderly people, caused by a mass of scybalæ lodged in the colon, and the proper treatment in such a case is to give a purge and commence with large enemata of tepid water, given while the patient is placed upon his left side. Should the mass be high up in the colon, the patient should be placed upon his knees and elbows, and afterward turned over upon his right side, so as to assist the water by gravitation to reach toward the ileo-cæcal valve.

CONVULSIONS.

A correct idea of the treatment of convulsions can only be obtained from a knowledge of the different conditions of which the convulsions

may be the only symptom. Thus the presence of a mass of round worms in the intestinal canal of a child will call for a purgative and santonin. (See Ascaris.) The convulsions arising in a patient suffering from advanced renal affection will demand the active treatment necessary for uræmic poisoning. (See Bright's Disease.) Epileptic convulsions will be best prevented by bromides, etc. (See Epilepsy.) In the same way the reader will find under Hysteria, Tetanus, Poisoning by Strychnine, Teething, Apoplexy, Alcoholism, Puerperal Convulsions, etc., the appropriate remedies mentioned by which the convulsions may be prevented or modified or rendered less frequent.

If called to see a patient laboring under an attack of convulsions (without any apparent cause demanding immediate attention, such as pregnancy or uræmia), the physician will have considerable difficulty in preventing himself from acting under the impulse "that he must do something." The position of "masterly inactivity" is the safest as regards drugs in a situation of this sort, where at the moment little can be determined about the causation or pathology of the symptoms. The patient should be placed in bed upon his back with his head and shoulders slightly raised, and all constrictions about the neck, thorax, or abdomen removed. If the tongue be protruded, and in danger of being wounded by the closure of the teeth, a lemonade cork may be inserted between the upper and lower molar teeth on one side. Unless the convulsive movements be severe and liable to cause contusions of the limbs or scalp, restraint should not be resorted to. In a series of rapidly succeeding attacks the vapor of nitrite of amyl may be judiciously employed. Chloroform or ether may be administered upon a sponge, or chloral hydrate may be given by the rectum. Heroic measures, like bloodletting, or the instantaneous blistering of a large surface of the body are wholly unjustifiable. In puerperal cases bloodletting may be indicated.

Infantile convulsions.—The routine plan of scarifying the gums in every case of convulsions occurring in young children, should be strongly condemned. The tough cicatrix forming over the incisions afterwards, generally is the source of serious future trouble. The writer has seen the leathery gums of infants who had been subjected to wholesale scarifications months previously for supposed delayed dentition, when the cause of the convulsions was probably a mass of curd in the intestines, the result of indigestible cow's milk. Sometimes, when the tooth should be above the gum, these old, dense cicatrices so hold it down, that the only course is to snip a piece out of the cicatricial tissue with scissors or a knife.

Called to a case of infantile convulsions between the fifth and thirtieth month, the writer, after thoroughly disinfecting his index finger, passes it into the infant's mouth and feels for any prominences over the line of the teeth, and if any tooth feels to be very near the surface, he scrapes through the tissue of the gum till the cusp of the tooth is felt grating against the edge of the finger nail. The little operation

is almost painless if the finger nail is sharp, and healing over of the lacerated wound never occurs.

Bromides are the remedy for convulsions of this class, and may be safely administered in all cases where there is reason to suspect a repetition of the attack in children or adults. A good formula for an infant of one year old is —

℞.—Ammonii Bromidi ℈ij.
Spt. aetheris nitrosi ʒj.
Chloral gr. ix.
Syr. aurantii flor. ℥ss.
Aquæ cinnamom. ad ℥iij.—M.

S.—A teaspoonful every two hours.

A warm bath is often efficacious in arresting the fit in an infant or young child, a mustard and wheaten flour poultice (equal parts) may be placed over the nape of the neck. It is always advisable to clear out the bowels with a smart purge as soon as the patient can swallow.

For the convulsions coming on during the progress of brain diseases and cerebral tumors, large doses of the bromides, combined with iodide of potassium, are indicated.

CORNEA, Inflammation of.

For inflammations of the cornea following extensive conjunctivitis, and ending in suppuration or ulceration, the indications are to relieve pain by the instillation of atropine, or, if there be much tension or danger of perforation, eserine should be employed. To secure absolute rest, the eye should be carefully bandaged, or a large shade placed over *both* eyes. In the inflammatory stages, with much photophobia and pain, astringent and stimulating applications must be avoided. Warm fomentations, and belladonna extract rubbed up with glycerin, may be smeared over the brow and outside of the lids.

Should there be much secretion, the constant use of a mild unirritating antiseptic lotion must be kept up. Boric acid is the safest and most efficacious (40 grains to 10 ounces). Bichloride of mercury (½ grain to 10 ounces) may be used.

Where the photophobia is intense, a free division of the outer canthus may be made, and leeches to the brow often afford considerable relief.

When the acute stage is over, much benefit will be obtained by stimulating treatment. This may be carried out before pain subsides if atropine be constantly used. The best application is the yellow oxide of mercury ointment, but it is too often used of a strength that aggravates the affection. 8 grains to 1 ounce of vaseline is generally enough for all purposes, and sometimes half this strength will be found to answer better. A minute portion of the ointment may be inserted inside the lids twice a day.

Calomel, dusted inside the lids once daily, often acts with great rapidity, and causes the ulcers to take on new action and induces rapid granulation. Seldom will nitrate of silver be required. In large pustules or sluggish ulcers, a mixture of cocaine (8 per cent.) with atropine solution relieves pain and tension, and mitigated caustic may be lightly applied to the ulcerated spot with very marked benefit. Better still, after the instillation of cocaine or the use of a cocaine disc, a little of the nitrate may be applied in solution (10 grains to 1 ounce) with a fine camel's hair brush, confining the application strictly to the ulcerated spot. This method may even be employed for deep ulcerations of the cornea if perforation do not threaten, and if there be no iritis. Eserine may be freely used in such cases.

In very chronic cases, a seton *above* the temple or behind the ear, or blisters in the same locality prove useful. When the ulceration is caused by the presence of granular lids, this condition must be met by proper treatment. (See Conjunctivitis.) Retton uses the thermo-cautery to corneal ulcerations.

Ford resorts to peritomy in troublesome, ulcerative, strumous, or suppurative keratitis, upon the principle that as the cornea receives its blood supply from the conjunctiva, the local depletion consequent upon a division of its vessels and of the loops which surround its circumference, tends to promote a healthy reaction and an absorption of stagnant cellular elements.

Walker has introduced a new operation under the name of perikerotomy, or "cutting around the cornea" in these cases; he makes a series of short incisions at the base of the cornea.

Internal treatment is of the greatest value, and constitutional measures must be employed from the beginning. Thus, in the phlyctenular form, as in strumous ophthalmia, of which it is generally a part, the treatment directed under conjunctivitis must be carried out, and an early change of air and scene is often followed by marked benefit.

When atropine, eserine, and cocaine fail to give satisfactory relief to pain, the remedies found useful in neuralgia of the affected nerve may be employed. 5 grain doses of butyl chloral every two hours for 4 doses may be given. 30 grains of chloride of ammonium, or 8 minims of the gelsemium tincture every two hours may be administered. In severe cases, especially in elderly patients with serpiginous ulceration, the free administration of stimulants with sal volatile in decoction of cinchona (40 minims in 1 ounce), must be attended to.

If the inflammatory action extends and hypopyon form—*i. e.*, pus appearing in the lowest part of the anterior chamber—if its absorption does not follow upon the continuance of the above treatment, a free incision or an iridectomy must be made; if only an incision be decided upon, it must be re-opened daily till the secretion of pus ceases.

Chronic or interstitial keratitis almost always depends upon inherited syphilis, and in addition to the remedies for the relief of pain and

photophobia as mentioned above, the internal administration of mercury must be pushed *short* of producing salivation. After acute symptoms subside, the yellow oxide of mercury ointment (1 grain to 1 drachm) should be daily applied.

CORNS AND CALLOSITIES.

By the removal of the cause, *i. e*, friction, or intermittent pressure produced by tightly fitting boots, the corn will soon disappear. The presence of corns, in many cases, is owing to the boots being too large. the friction caused by the skin of the foot rubbing against the leather in walking is enough to produce painful corns. Children frequently have their boots made too long, in order to allow for the growth of the foot during the wear of the boot. The result is that they get into the habit of strongly flexing their toes in walking, to prevent the slipping up and down of the foot inside the boot. The result is, corns appear on the upper surface of the phalangeal joints, and deformity of various kinds results which last during life.

The first indication, in the treatment of these conditions, is to obtain properly fitting boots. (See Bunion.)

The corn should be pared with a sharp knife, and if skilfully done, it can be entirely removed at one operation, but this requires skill and much practice.

After the removal of the thickened epithelium, if the corn cannot be cut entirely out, a little glacial acetic acid may be applied with a bit of wood (the end of a match), and after the superficial film peels off, the application can be renewed till the diseased cuticle disappears. Nitrate of silver is painful, liable to be followed by inflammation and lameness, and should not be used.

The favorite remedy is salicylic acid. It is the basis of nearly all the corn cures in the market. It appears to possess the strange property of only dissolving or acting upon the diseased epithelium, having no effect upon healthy tissue.

The usual formula is—

R.—Acidi salicylici	ʒj.
Ext. cannabis ind.	gr. x.
Collodii flexilis	℥j.—M.

S.—To be daily painted over the corn.

Soft corns may be best treated by the separation of the opposing surfaces with felt or amadou plaster, with a circular hole cut in the centre. This hole may be filled with dry salicylic acid.

Rosen successfully treats corns, warts, and callosities in the following manner: The growth or patch having been well moistened with an antiseptic solution, is thickly covered over with salicylic acid. Upon the top of this is placed several layers of moistened boric lint, and over all a piece of gutta-percha tissue and a bandage. At the end of five

days, when the dressing is removed, the thickened epidermis easily peels from the subjacent structures.

Unna treats sub-plantar corns by painting a broad ring of glycerine jelly around them with a stiff brush. When the jelly has firmly set, the interior of the ring is filled with a circular piece of strongest salicylic plaster (salicylic acid, 40; creasote, 40), and the whole covered up with two layers of glycerine jelly, and when dry a small pad of cotton wool. This dressing will last for a week, and may be renewed till the horny layer of the epidermis is entirely removed.

Chromic acid, iodine, moxas, and caustics of various kinds have been employed, but salicylic acid seems to leave nothing to be desired.

CORYZA—See Catarrh and Bronchitis.

COUGH.

Under Bronchitis the treatment of cough is discussed, but the physician will meet with many cases where a persistent dry cough or bark is the only symptom present, and where the most careful examination fails to discover any abnormal physical sign in the lungs or air-passages.

To successfully treat such cases it is obvious that the cause of the cough must, if possible, be ascertained. If there be any reason to suspect from the history of the case, or from a careful reasoning from all the available data that there is any latent pulmonary mischief present, the ordinary sedative remedies before mentioned may be employed. Thus the hacking, short, dry cough of early phthisis may be traced to its cause, should there be a subfebrile temperature, marked loss in body weight, and a bad family history with unfavorable surroundings, and the proper treatment will be easily indicated, though no expectoration or physical signs be present. In dry catarrh of the bronchial tubes of *large* size, though the writer has seen many such cases where no rale or physical sign existed, nevertheless the presence of some small quantity of tenacious or inspissated mucus or muco-purulent secretion at some time or other will be found to clear up the case. The treatment in such a case must include more than mere sedatives or palliatives. The dry bronchial surface must be stimulated so as to cause the pouring out of a secretion of liquid consistence, after which often the cough practically ceases.

The injurious administration of sedatives and narcotics in a haphazard way in bronchitis has already been mentioned, but the physician must not err in the other extreme, especially as incessant, violent, or spasmodic attacks of cough without any expectoration may in time lead to serious pulmonary trouble.

Excluding, then, all cases of cough having their origin in bronchitis or laryngeal inflammation or diseases, it may be found that the throat is the seat of the irritation. Acute, chronic, or granular conditions of the pharyngeal mucous membrane may produce incessant coughing.

Elongated uvula, enlarged tonsils, polypi, and other growths at the back of the posterior nares may call for appropriate local treatment.

For the treatment of the reflex cough accompanying catarrhal sore throat, there is no remedy so effectual as a spray of the following, which may also be used as a gargle:

℞.—Acidi carbolici		ʒj.
Pulv. sodii bor.		ʒj.
Cocainæ hydrochlor.		gr. xij.
Glycerini purif.		ʒss.
Aquæ rosæ	ad	℥xij.—M.

S.—To be used as directed.

The inflamed membrane can also be treated by chlorate of potash, nitrate of silver, alum, tannin, or other appropriate remedy.

Ear cough unquestionably is to be met with, and unless the diagnosis be correctly made there is little probability of the cough being relieved by drugs. A careful examination will reveal some irritation or foreign body in the meatus. In the case of children, peas, beads, etc., may be found; and in adults, plugs of dried wax. The wax is more likely to give rise to cough if partially loose in the passage, and sometimes the movements of the jaw in eating or speaking may so disturb the mass that cough results at these times. The removal of the foreign body by syringing is generally followed by instant relief.

In infants the advent of each tooth is sometimes heralded by a smart spasmodic cough, which stops when the crown is through the gum, and in older patients the removal of a painful or carious stump has been sometimes followed by the cessation of a cough that has been a source of anxiety for a long time before.

Liver diseases (abscess and calculi) have been the cause of cough, and in one case known to the writer a bilious attack, resulting from indiscretion in eating, always brought on a severe, spasmodic, barking cough, relieved or removed by a smart purge.

The stomach cough has been long recognized, and yields to remedies which cause evacuation of the gastric contents, or to sedatives like bismuth, codeine, or hydrocyanic acid. Gout may be ushered in by a severe cough, which is relieved when the paroxysm localizes itself, and the presence of foreign irritants in the intestinal canal—as round worms, fruit seeds, etc.—may cause cough in children, which yields to a smart purge.

Brain mischief, involving the respiratory centre, is sometimes the origin of cough, and hysterical cough is commonly met with. It should be treated by antispasmodics like asafœtida and valerian.

Severe spasmodic cough, arising from almost any cause, is always benefited by large doses of the bromides, especially by the bromide of ammonium. Chloroform, in moderate doses (5 minims), is a powerful

sedative in most cases, and chloral hydrate, in small oft-repeated doses, will allay cough when the cause cannot be removed.

Gelsemium, grindelia, conium, and sanguinaria may be used like morphine and codeine, to lessen the sensibility of the respiratory centre.

Sir Andrew Clarke believes that the very troublesome affection known as the barking cough of puberty, occurs in over-fed or too often fed children. He insists upon a simple but liberal dietary, arranged into three, or at most four meals a day, active out-door exercise, early hours, and general discipline. Locally, he uses glycerin of borax with oxychlorate of bismuth and morphine; or, the same mixture with 10 per cent. of cocaine instead of the morphine, brushed over the whole interior of the throat after each meal, and at bedtime.

Internally, he uses the syrup of bromide of iron and quinine, with small doses of arsenic. When this fails, he gives a pill containing reduced iron, valerianate of zinc, belladonna, and nux vomica, pushed till the physiological effects of the belladonna show themselves.

CRAMP.

The very painful tonic spasm which commonly affects the muscles of the calf of the leg, often calls for treatment. Smart friction may be employed over the contracted muscle, and, by a voluntary effort, the opposing muscles may be thrown into firm and prolonged action, which soon relieves the spasm. By tying an elastic band, like Esmarch's, tightly round the thigh, sometimes the cramp yields at once.

CRETINISM.

The first thing to do is to make a complete change in the environment of the patient. Removal to a dry, elevated situation is essential; a mountain atmosphere, with a porous soil, if possible, should be selected. Most of the day should be spent in the open air in gentle exercise, and a liberal diet of milk, with plenty of fresh animal food and a moderate amount of fresh vegetables, may be advised. Cod liver oil, Parrish's syrup, phosphate of lime, lactophosphate of lime, with malt extract, and most painstaking and persevering efforts to inculcate a higher moral and intellectual training, and to guard against the supremacy of the lower instincts, may do much to strengthen moral control and improve the mental capacity.

CROUP.

Any remarks about the treatment of croup must be valueless, unless it be made clear which of the conditions embraced under this misleading name is prominently before the mind of the writer when discussing the question. In the first place, the affection known as laryngis*mus* stridulus, and unfortunately wrongly called false croup—a purely nervous disease, not associated with any laryngeal inflammation—is not referred to here. Its treatment will be mentioned under its own name.

Acute laryngitis, which at the bedside can be differentiated from the varieties of croup, is also left out of consideration for the present.

There remain subject to further explanation two distinct affections at least—known under the common names of false croup and true croup. About the first (or false croup) there should be little difficulty. It is spoken of as false croup, spurious croup, spasmodic croup, inflammatory croup, stridulus laryng*itis*, spasmodic laryngitis. (Some of these names are unfortunately applied to laryngis*mus.*) In the great majority of cases, where the services of the physician are urgently demanded for the relief of croup, it will be the spurious or spasmodic variety which he will have to deal with.

The attack generally occurs *suddenly* and at night, the child waking with a *hoarse*, hard, clanging cough. His voice and cry may be hoarse, but not whispering. There is alarming dyspnœa from the beginning, and each inspiration is attended by a loud cooing or crowing sound. The attack, if left alone, may probably pass off in a few hours, and the child sleeps and awakes nearly well, though the attacks may, and probably will, return again upon subsequent nights.

The physician will see that, called by whatever name, he has got to deal with a mild *laryngitis*, probably of catarrhal origin, accompanied by spasm of the laryngeal muscles, in which false membrane, diphtheria, or exudation plays no part.

The treatment of this affection is simple. A smart emetic is indicated at the outset. The choice lies between ipecacuanha, tartar emetic, sulphate of zinc, sulphate of copper, apomorphine, squill, or mustard and hot water, with mechanical tickling of the fauces by a feather.

Ipecacuanha—5 grains, or drachm doses of the wine may be given every fifteen or thirty minutes to a child of two years old. $\frac{1}{8}$ grain of tartar emetic may be given in solution, or half drachm doses of the wine every fifteen minutes, till vomiting supervene.

The following mixture is more valuable than either of its active ingredients when given alone.

It may be given to a child one year old:

℞.—Vini antimonii ℥iv (*i. e.*, gr. j).
Vini ipecacuanhæ ℥iv.
Syr. scillæ ℥iv.
Aquæ dest. ad ℥iij.—M.

S.—A teaspoonful every fifteen minutes till vomiting occurs, then half a teaspoonful every two or three hours while the cough lasts.

Sulphate of zinc in 3 grain doses, or the copper salt in $\frac{1}{4}$ to $\frac{1}{2}$ grain doses, acts more promptly, but the after nauseating, expectorant action of the ipecacuanha and antimony is most valuable, as the dry, swollen, or congested condition of the mucous membrane is relieved, and the secretion of mucus increased.

The writer has never given apomorphine as an emetic to very young children, and from large experience of its use by the mouth in adults he would fear that its emetic action in infants would be uncertain, and followed by much depression. Unless in desperate emergencies it would appear that the hypodermic administration of it to very young children should not be resorted to. $\frac{1}{50}$ to $\frac{1}{35}$ grain probably would cause vomiting in a child one year old when given hypodermically.

After the establishment of free emesis the symptoms of laryngeal spasm generally rapidly subside. It will be found wise to continue the use of expectorants for a few days longer, to keep the child well clad and confined to the sick room, the atmosphere of which should be warm and moist, and due precautions should be taken against future attacks, which are apt to be easily induced by even mild attacks of catarrh from exposure to cold and damp.

While the action of the emetics is being established, the child may be plunged into a warm bath, and after being rubbed dry and placed between blankets a hot poultice may be tied round the throat, or Graves' method may be tried of applying a sponge squeezed out of very hot water, and kept in close contact with the laryngeal and tracheal region, and renewed every few minutes till thorough reddening of the skin be produced. Some cases where the symptoms are severe may require blisters, and a small cantharides blister, not larger than a florin, may be placed over the larynx and trachea for two hours, and be followed by a warm poultice. Stimulants may be given if the symptoms continue for any length of time, especially in weak children. and pulmonary complications, if present, must be treated by counter-irritation and ammonia with sustaining diet.

About the nature of true croup very conflicting opinions exist, and from a study of the writings and experience of those who have had opportunities of dealing largely with the disease, it is impossible to come to any other conclusion, but that different writers have described two totally different affections under the name of true croup. Though this is not the place to dwell upon the pathology of the affection, a clear conception of the two prevailing opinions must be formed before the physician can reconcile the different reports of the treatment recommended by and adopted by those who have written upon the subject, but only the briefest reference can be made to these views.

In France and Germany croup is regarded as true diphtheria manifesting itself by the production of a membranous exudation in the larynx or trachea, or in both, this membrane being always the local manifestation of a general asthenic disease, and never the result of simple acute inflammatory action.

By the majority of English authorities true croup is still regarded as a true or simple acute inflammation of the lining membrane of the larynx or trachea, or both, generally, though not always, eventuating in a membranous exudation.

The physician who takes one or other side of this dispute will find

his treatment of the disease very much modified by the views which he holds, and it is manifest that there must of necessity be a wide difference between the termination of a case of a highly infectious asthenic disease and a simple acute inflammation of the laryngeal mucous membrane. The writer has seen a few cases where all the clinical phenomena, mode of onset and termination, corresponded to a typical example of true croup as described by French and English writers, and he was satisfied that there were features present which proved that these cases were true laryngo-tracheal diphtheria. He is, however, certain that the affection as ordinarily seen, and known by the name of "true croup" in the north of Ireland, and which presents the chief clinical features described by French and English physicians, is not diphtheria.

For very many years, in the city of Belfast, diphtheria was practically unknown, and one of the ablest and most learned physicians, in extensive practice, informed the writer in 1876 that, though looking out always for the disease, he had never once, seen a single case of the affection during twenty years.

Cases of true croup were constantly to be met with during this period, and very often proved fatal, and there clinical features were, apparently, the same then as to-day, when diphtheria is, by no means, so uncommonly seen in the locality, though the number of cases of true croup is certainly not on the increase.

From many other considerations also, the writer believes that, in the great majority of instances, when the physician is called to treat a case of true croup in this country, he may safely feel that he is dealing with a non-contagious acute inflammation of the upper part of the air-passage, and may act accordingly.

If the case be seen at the very beginning of the attack (which is rare, as the symptoms of true croup are more insidious and less alarming than in false croup), an emetic should be at once administered. The mechanical act of vomiting clears the air-passages of all secretion, and the after effects of the nauseating expectorant are most valuable in modifying the nature of the inflammatory or congestive action, and liquefying the expectoration or thickened secretion of the parts. The physician must be guided in his choice of an emetic by the features of the individual case, and, as a rule, the remarks made upon this detail, when speaking of the treatment of false croup, are also applicable here. Tartar emetic alone, or in combination with ipecacuanha, is the most reliable method of producing emesis at this stage.

Much mischief may be done by pushing this remedy, though, in spurious croup, there is little danger of overdosing with emetics because the attack is a short one, and there is little to be feared by depressing or exhausting the patient's strength.

With true croup the case is different. The siege is a much longer one, and everything that draws upon the slender resources of the little patient must be avoided, and his strength jealously watched, no un-

necessary expenditure of force or energy being permitted. Hence, after an early emetic, further administration should be suspended till there are signs of the formation of a membrane. Antimony, in large and repeated doses, is therefore contra-indicated.

Having then decided upon an emetic and while awaiting its action, the physician proceeds to carry out the other important indications in the way of treatment. The patient is put to bed, and the temperature of the sick room raised to 60° or 65° F. by the combustion of coal in an open grate. The use of gas and other stoves is to be discountenanced. Should the patient be a very young child or infant, or should it exhibit much restlessness, it will be found a wise course to undress it completely and put on a little flannel night-dress, and wrap it up in a warm blanket and place it upon the knee of a good nurse. The air of the room must, as far as possible, be saturated with steam or aqueous vapor. This is best done by the ordinary bronchitis kettle, or, in its absence, by fitting a tube of lead, tin, or even paper upon the pipe of an ordinary kettle, and leading the steam within safe distance of the patient's face.

Where the child can be placed in its cot, and a canopy made by hanging sheets over and around it, a moist and warm atmosphere can be easily maintained for any length of time. Where this is not practicable, the nurse and child may be surrounded by tall screens, inside which the tube from the kettle may be brought. The various inventions for boiling water and creating steam—by the combustion of gas, paraffin oil, and alcohol—in the sick room, should be avoided, as the air may be rendered dangerously impure in this way, and it should never be forgotten, as it too often is, that the purity of the air is of *vital* importance to the patient, who can only get a limited quantity into the lungs at each inspiration.

The ventilation of the room is an important matter for this reason, and the physician should superintend these arrangements himself. It is a wise plan to strictly insist that as few persons as possible be allowed to remain in the sick chamber for any length of time, and the temperature of the room should never be allowed to vary, if possible, more than a few degrees. A thermometer should be suspended somewhere in the immediate vicinity of the patient, and the nurse should see from time to time that it registers always about the same heat—*i. e.*, about 60° if in winter or 65° if in summer.

The diet from the very first should be sustaining and stimulating. Milk in various forms, and peptonized if necessary, will be the most appropriate. Beef tea, beef jelly, Valentine's meat juice or chicken jelly should be given in small quantity and often, the physician remembering that soon a time may come when appetite and digestion will lag, and when it will be both difficult and injudicious to force the nourishment upon the little patient.

A skilful nurse will know when to present it, and if emetics must be continually administered she will give aliment as soon as possible after

the effort of vomiting has subsided, so that digestion may be as little interfered with as possible. As the child gets peevish it may refuse all food and ask for water; if this be freely given and thirst assuaged, the child may very soon have no desire for anything else, and feeding be at a standstill. It will thus be wise to only give milk or liquid nourishment all through. Stimulants at a later stage may be indicated, and if so they should be freely given, and if possible always along with the food. Coleman's beef wine with extract of malt is very suitable, and generally is relished by children. Rennet may be added to the milk, or pepsin may be mixed with the beef tea; and later on, when swallowing becomes difficult owing to the dyspnœa, or when great nausea or vomiting prevents the food being got into the stomach, rectal feeding with peptonized food should be tried. For this purpose the valuable nutritive suppositories of Griffin are exceedingly convenient. It may be advisable in some cases to stop all feeding by the mouth for a time, say eight or ten hours, and the nutritive suppositories if retained will well support life alone; by this time the child may greedily take food.

Before mentioning the different remedies generally given internally for the relief of croup, *local* treatment may be considered. Hot poultices to the throat and neck afford some ease, and may do good by relaxing spasm. Hot compresses, or a collar of spongio-piline squeezed out of hot water, is more convenient, and sometimes the appearance of a hot poultice sends the patient into a struggling fit, which always does harm. Cold compresses in some cases afford comfort, and if so they may be persisted in with advantage. They were much used by Niemeyer.

Cauterization of the larynx with nitrate of silver or other caustics should never be attempted; and even in those rare cases where the disease is evidently depending upon diphtheria, and the membrane is visible in the pharynx, cauterization is a very questionable proceeding in the case of young children.

Various substances in the form of vapor or spray have been locally applied. Of the vapors the following have been used, either sprinkled about the room, added to boiling water, or inserted on lint into the receptacle in the nozzle of the pipe of the bronchitis kettle: Eucalyptus oil, creasote, iodine, bromine, carbolic acid, tar, terebene, turpentine, tinct. benzoin. comp., chloroform, etc.

It is very questionable if any good ever results from these vapors; undoubtedly harm arises if the concentrated vapor of any of these substances reaches the larynx. A little turpentine or eucalyptus is of use by assisting to keep the air of the sick chamber sweet and pure. Oxygen inhalations may be useful in the later stages.

Rothe recommends the vapor produced from heating a small quantity of calomel upon a plate under the bedclothes.

Sprays have been much used in croup and also in diphtheria, and if judiciously employed much good may be achieved by them, those who

believe in the diphtheritic nature of croup place most faith in their use.

Seigle's steam spray apparatus may be selected to diffuse a solution in the form of very fine spray against the fauces. The India-rubber apparatus used for scattering perfumes, and which may be obtained from any chemist, is much simpler and quite as good. The following is, perhaps, the best of local spray applications:

℞.—Pulv. sodii bor ℥jss.
Glycerini ℥j.
Aquæ rosæ ad ℥viij.—M.

S.—To be used every half hour as a spray.

Various substances are employed in this way, with the view of causing solution or disintegration of the membranous exudation believed to be present. Lime-water and lactic acid are the most frequently used; 1 ounce of the dilute lactic acid (1 : 7) may be added to the above formula. The following is used on the Continent:

℞.—Acidi lactici ℥iij.
Liquor calcis ℥viij.—M.

S.—To be used as directed.

Carbolic acid (1 drachm to 10 ounces) is also used, and sulphurous acid has been tried, but it might cause dangerous laryngeal irritation. Pure liquid vaseline spray is soothing, and can do no harm. Papain, pepsin, trypsin, and other substances, which have been used as direct applications to diphtheritic patches in the pharynx and on the tonsils, have been recommended in croup, but their use has not been attended with any benefit. Of all the remedies employed locally, the weak spray of glycerin and borax, or carbolic acid, is the least objectionable and most likely to be followed by some benefit.

Of remedies for internal use in the treatment of croup there is practically no end. Many of these have been urged upon very slender theoretical grounds, and chiefly with the view of destroying germs or bacilli, which are supposed to be the sole cause of the disease. Only the most important will be mentioned.

To return again to the management of the case. After the administration of the first emetic, as mentioned on page 158, various methods of treatment may be selected by the physician. The writer, after trying many of these, is inclined to advise the use of a simple expectorant, which may be given every three or four hours without producing nausea or vomiting; and if symptoms of dyspnœa or embarrassed breathing appear, the same mixture may be given every ten or fifteen minutes till vomiting supervene.

This treatment has the merit of doing no harm, and does not interfere with the more vital matters of food, stimulants, steaming, etc.,

while many of the heroic methods advocated every year in the current literature of medicine must increase the mortality of the disease. A mixture like the following may be given to a child two years old:

R.—Vini ipecacuanhæ ℥vj.
Spt. ætheris nitrosi ℥iv.
Spt. ammoniæ aromat. ℥iij.
Syr. tolutani ℥j.
Aquæ camphoræ ad ℥iv.—M.

S.—A teaspoonful in an equal quantity of water every two or three hours, and, if the breathing becomes distressing, every fifteen minutes till vomiting occurs.

If feverishness be marked, ¼ minim of tinct. aconiti may be added to the first six doses. Should the distress, cough, and dyspnœa demand the continuous use of emetics, one which will act quicker than the above is necessary. Tartar emetic is too depressing, and cannot be safely administered in the later stages of a disease characterized by great depression and muscular prostration. Apomorphine is open to the same objection. Alum in doses of half a teaspoonful with syrup every fifteen minutes is extolled as a safe emetic in croup. Sanguinaria in powder is recommended highly in combination with ipecac.

The writer has never seen it given in croup with this object, but from what he knows of the powerfully depressing action of the drug in other conditions, he does not intend to ever use it for this purpose.

Turpeth mineral (subsulphate of mercury), in doses of 2 grains every twenty minutes, was used by the older practitioners with good results.

Sulphate of copper, ½ grain in solution, given every ten minutes to a child one year old, was Trousseau's favorite remedy for producing vomiting in croup. It is not so safe as the sulphate of zinc, which may be given in doses of 3 grains, and repeated every ten minutes till vomiting results.

Where ipecac is followed by too much depression, or where its action is too slow in the later stages of croup, the physician will be wise in discarding all emetics except the zinc sulphate.

Oil of turpentine, in teaspoonful doses, has given very striking results in the hands of Lewentaner. Calomel, in ¼ to ½ grain doses every two hours, was given by Niemeyer, and some still follow his rather questionable practice.

Corrosive sublimate, by way of variety, has been substituted for the calomel treatment, with the usual report, that it "has been followed by success," the dose for infants (one year old) being about ⅛ grain, taken during the twenty-four hours. It has been combined with ichthyol inunctions and antipyrine enemata.

The red iodide of mercury has been also given. Without further

knowledge of the action and effects of these heroic measures, the discrete practitioner will not be blamed for adhering to the old paths.

Iodide of potassium, sulphide of calcium, tincture of iron, and every remedy used in diphtheria successfully have been administered with reputed advantages in croup.

Jaborandi has been given with the idea of causing detachment of the false membrane, but the doses likely to have any effect in this direction would probably cause serious cardiac depression. The remedy, however, is certainly worth further trial, and some cases have been reported of very favorably since the drug was recommended by Sanne.

Sooner or later, in the great majority of cases, the physician will have to face the question of tracheotomy. This is a very serious problem—one of the most serious in medicine, for various reasons, chiefly because if not done early it is *almost certain* to be useless. The physician hesitates to recommend the opening of the trachea or larynx in the absence of serious symptoms, and when the case presents no features contra-indicating recovery without the operation. Soon the aspect of the case deepens, he awakes to the probable necessity of the operation, mentions the subject to the patient's relatives—who always are stoutly opposed to the operation—delay occurs, and when the case becomes desperate, at last an operation is accepted, and by the time it is done death is sure to speedily follow it.

The writer, who has opened the trachea several times under these circumstances, always felt that, as it was the only chance in desperate cases, it was criminal in parents to refuse consent, and imperative upon the physician to have the operation done even when the patient was sinking.

All his cases, where he opened the trachea in children under five years of age suffering from croup in its last stages, died, and every case that he has seen operated upon by others has also died. During the last fifteen years he has not had personal knowledge of a single case recovering after the operation on young children who had been suffering from true croup.

This melancholy record can only be explained by the hopeless stage at which the operation was undertaken. In none of the cases was there any difficulty in the operation save once, when the wound was blocked up in a diphtheritic patient, who was almost completely asphyxiated; but the writer, after applying his lips directly to the wound, easily inserted the tube. This patient lived longer than any of the others, but died inside ten days, and though no ill effects followed the sucking of the wound, the writer would not do it again.

This mortality of *every* case contrasts painfully with French statistics, and it is more than probable that the belief in the diphtherial nature of the disease in every case determines a very early operation.

The writer's unfortunate experience, and his knowledge of the equally unfortunate experience of his friends, suggest to him that it may be

his duty to *recommend* non-interference when the case is in the last and hopeless stage. Though this is a very serious decision, he has taken the responsibility in two cases lately where an early operation was urged, but the parents refused their consent till congestion of the lungs, asphyxia, cold extremities, complete muscular prostration, and absence of pulse led him to advise that it was then too late for interference. Any remnant of a shadow of hope seemed to him to be as great, if not greater, if the patient was left alone, death appearing to be certain from the operation.

As soon as the thoracic walls begin to fall in during the act of inspiration, an operation should be insisted upon; but, if the parents refuse their consent, the advice should be repeated later on, and the surgeon, it is needless to say, should not refuse to open the windpipe as long as the faintest hope of success is likely to attend the operation.

It may seem as if the writer has dwelt upon this aspect of the great mortality in late tracheotomy perhaps too much, but he believes that there is a serious danger of the physician himself being a party to the delay, and hence it is of vital importance that he should keep before him the view that, if he procrastinate, there will certainly come a time when it will be *too late* to operate successfully.

Every physician should have a clear idea of the steps of the operation, because circumstances may so place him in a position where it will become his duty to operate and save life; before a surgeon can be procured it may be too late.

The first question is the one of anæsthesia. Speaking generally, chloroform should be administered, but in many of the cases of croup or diphtheria that comes under the surgeon, the disease has advanced so far that partial anæsthesia has already taken place, owing to the venous condition of the blood, and the operation may be immediately commenced without waiting for the action of an anæsthetic.

Owing to the anatomical condition of the air-passages in young children, the operation of laryngotomy should be left out of the question. The trachea should be opened, and the opening in the tube should always be made above the isthmus of the thyroid gland. Sometimes the isthmus must be divided if the space is limited, but the operation in young children should never be attempted with a view to open the trachea and insert a tube below the isthmus. This is owing to the shortness of the neck in children. *The* operation for croup or laryngeal diphtheria in such cases is crico-tracheotomy or laryngo-tracheotomy.

The patient should be placed in the recumbent position, with his thorax raised and the head extended. The operator, standing on his right, feels for the cricoid cartilage, and makes an incision having this point rather above its centre. The incision must be fair in the middle line, and may be made through all the soft parts in front of the trachea. About one and a half inches will be long enough. The trachea should be felt for by the tip of the left index finger, and any

veins drawn aside. When its rings come into view, the point of a sharp scalpel is inserted, and the first three rings, with the cricoid, should be divided from below upward. If the trachea does not prominently present in the wound, it may be caught up by a sharp hook and drawn forward, while the scalpel, with the edge upward, cuts an opening through the upper rings. After the air and mucus have bubbled into the wound and been expelled by the expiratory efforts, the tracheotomy tube can be inserted. The opening in the trachea must be free enough to take in as wide a tube as possible, and it is a mistake to make a very limited incision, as it greatly increases the difficulty of inserting the tube.

After the tube is placed *in situ* and fastened by broad tapes passed round the neck, the little patient is put into his cot, or allowed to sit upon the nurse's knee, the space around them being enclosed by sheets and canopied over, and the tube of the bronchitis kettle is brought inside the enclosure, thus ensuring a most, soft, and warm atmosphere.

The temperature of the room must be always watched by the thermometer, and never allowed to fall under 65° F. If the patient be old enough to be trusted not to pull at the tube, the ordinary "croup cot" saves much trouble, but if very young and restless, the nurse's knee is the safest place. It is absurd to attempt to keep some children by force in bed, and some will not tolerate the confined moist space. A large piece of muslin squeezed out of hot water may be folded and laid over the neck, covering the wound and tube in such cases.

Nurse should be directed to constantly cleanse the opening in the tube, and if it gets plugged by mucus or shreds of membrane she may occasionally insert a feather previously dipped in any weak disinfectant, and fish about for any obstruction, which is easily entangled, in its plumules. The spray of glycerin and borax, or of weak carbolic lotion, may be constantly used, and will be of great use in keeping the skin wound healthy and sweet.

The tube may be finally removed about the sixth day in most cases.

After the operation the treatment must be scrupulously continued as before, food, stimulants, and a mild expectorant given regularly. Iron may now be ordered with great advantage. For a child two years old the following may be employed:

℞.—Tinct. ferri chlor. ℥jss.
Vini ipecac. ℥ij.
Potassii chlor. ℥j.
Glycerini et aquæ ad ℥ij.—M.

S.—Take a teaspoonful in two teaspoonfuls of water every four hours.

Some good results are published from the operation of intubation, and as improvements in the tubes are being steadily achieved, this method may yet become a most valuable one.

CYSTITIS—See Bladder, Inflammation of.

DANDRUFF (Seborrhœa Capitis).

The skin of the scalp should be saturated with oil, and kept in this state, no soap or washing with water being allowed. For cleansing purposes more oil should be poured on, and the scalp then rubbed clean with a soft cloth. Almond or olive oils are generally used, though inferior to an animal oil. It is difficult to get a suitable animal oil free from odor. Lard is too thick. Trotter oil is the best, but there is difficulty in procuring it genuine. Merely smearing of it over the hair is useless; it must be applied freely to the scalp.

In mild cases the oil treatment is all that is required, but if the case resist this method, the scalp must be submitted to thorough cleansing at intervals of not more than seven days.

This may be done by using powdered borax as a soap. With tepid water a good lather is easily raised, and the scales are dissolved or disintegrated, and the scalp thoroughly cleansed. After drying, the oil is applied again.

Yolk of egg may be used in the same way. Hebra used a saturated solution of green soap in alcohol for this purpose.

Shoemaker recommends the oil of ergot, and uses soda soap, medicated with oil of chamomile and sulphur, to wash off the scales.

A weak ointment of the oleate, or of the red oxide of mercury, or dilute citrine ointment, is sometimes useful. Some specialists, believing in the parasitic origin of the disease, advise weak solutions of corrosive sublimate, lotions of sulphur, and long lists of antiparasitic substances.

Internal medicines appear to be useless.

The partial baldness often resulting is best treated by the ointments mentioned under baldness.

If chronic eczema has been the cause of the seborrhœa, the following often rapidly causes permanent improvement:

℞.—Liq. carbonis detergens ℥ij.
Hydrarg. ammon. ℈j.
Vaselini ℥iij.—M.

DEBILITY.

The treatment of this condition need not be dwelt upon here. The indications are those for the treatment of the different diseases of which the debility is the result, and the remedies will be given under their appropriate headings.

Measures which improve nutrition, as cod-liver oil, iron, alcohol, massage, arsenic, phosphates, malt extracts, quinine, bitter tonics, galvanism, static electricity, sea voyages and bathing, exercises of various kinds, and the remedies suitable for the different forms of debility,

whether caused by constitutional diseases like fevers, phthisis, etc., or produced by disease in separate organs, as in valvular heart affections, will be mentioned when the treatment of these diseased conditions are discussed.

DELIRIUM.

The appropriate treatment of this *symptom* will be referred to when considering the treatment of the different fevers and diseases upon whose presence the delirium depends. (See particularly under Typhoid Fever.)

DELIRIUM TREMENS.

About the treatment of this serious affection much difference of opinion has always existed, but the difficulty is certainly becoming less since the natural course of the disease, when left to itself, is becoming better understood. The patient, even in the mildest case, should be regarded as insane for the time, and it is the serious duty of the physician to impress upon his friends that he cannot be trusted for a moment out of sight, as the delusions or illusions under which he suffers may impel him to injure himself or others. Often his surroundings are such that removal to a properly regulated hospital, where suitable provision for such cases is provided, is the only course open to the physician to recommend in violent cases. The room in which the patient is to be confined while the active stage lasts should be as free from noise and disturbance as possible, and attention should be given to the window fastenings and all removable furniture, and objects which might become formidable weapons in the hands of a delirious patient should be placed outside his reach. Though the great majority of the subjects of an attack of delirium tremens betray no evidence of suicidal or homicidal tendencies, the writer has encountered many instances of the contrary during a prolonged residence in hospital, where such cases were common. He has witnessed and experienced several hair-bredth escapes from their violence, while they were laboring under the delusion that the nurse or attendants were the hated objects which the hallucination of their disordered vision had conjured up. The room should be kept in comparative darkness, and it will be well if the patient can be kept in bed. Much will depend upon the tact of the nurse, who may be able by humoring the patient to keep him quiet and at rest. Violent and repeated struggles may be caused by an indiscreet and quick-tempered nurse, and may have a serious influence upon the patient's chances of recovery in bad cases. As a rule, forcible restraint will not be often called for, and the nurse should be made to understand that it is much easier to keep a patient upon his back in bed by gentle persuasion and mild restraint than to allow him to once get up and initiate a struggle, when considerable force will be necessary to get him again into bed. Where this method

fails with a restless patient a sheet may be so tied across the bed or tucked in that his movements will be considerably hampered. The straight-jacket—rightly regarded by every physician with disfavor—must in some cases be employed; and the writer has satisfied himself that he has seen it induce rest and calm, without which the patient's struggles could not have been subdued, and death from exhaustion would inevitably have supervened. Such cases are, however, rare, and are no justification for the coarse or cruel abuse which sometimes may be noticed at the hands of untrained nurses or attendants.

The physician should insist that, save one relative or friend who may have the right of passing in or out of the sick-room, all visitors must be strictly forbidden, and the most complete rest and quiet made to prevail.

Food should be administered with regularity, and it should be of the most sustaining and stimulating kind. Solid food, owing to the state of the digestive organs, cannot be taken. Strong soups, beef tea, beef essences, and beef jellies, with an unlimited supply of milk, should form the diet of a patient during the acute stage of the disease.

Attention to these measures will safely carry a large majority of patients through their attack, and without any narcotics or hypnotics, upon the third night or fourth morning the patient exhausted and wearied by his restless movements, falls into a natural slumber of variable duration, from which he generally awakes comparatively well and free from hallucinations.

To properly treat the disease in all cases, the physician must keep this spontaneous tendency toward recovery always before his mind. Many cases, nevertheless, will demand some further therapeutic measures, and few instances will occur in which some of the distressing symptoms may not be removed or modified by judicious administration of medicine.

The first question which the physician must decide is the one of alcoholic stimulants, and, as mentioned under alcoholism, the popular prejudice is strongly against the withdrawal of the patient's favorite beverage. In many instances it will be found that he has already ceased drinking just before or soon after the first symptoms of the affection have declared themselves. The physician may be certain that in the great bulk of cases alcohol will do no good, and in very many, especially in young subjects in their first attack, its administration will aggravate or prolong the excitement.

The case is different with older patients, especially those who have taken alcohol for long periods, and in whom symptoms of pneumonia or of cardiac failure manifest themselves. Here alcohol must not be withheld unless at great risk; but such cases are comparatively rare, and even in them the alcohol should not be started at the very beginning of the attack. When dyspnœa, pallor of the face, or lividity, or any approach to symptoms of syncope, with failure of pulse, alcohol

must be given freely, in conjunction with large doses (1 drachm) of spt. ammon. aromat., or ether.

The great question in the treatment of delirium tremens is the use of narcotics or hypnotics. There cannot be a doubt but that some cases would be better without them all through the attack, and it is equally certain that they should not be given in any case at the beginning. It appears probable that a patient who would not fall into natural sleep till about the fourth night if let alone, will not be sent to sleep by narcotics *much sooner*. It is also highly probable, where sleep has followed the use of a narcotic in the early stage, that the case has chanced to be one of those mild forms of the affection which would have terminated in sleep if left to itself. Should hypnotics, then, be administered at all in delirium tremens? The answer to this question must be in the affirmative.

The writer has satisfied himself that even a very short curtailment of the period of excitement in bad cases may save life, and one cannot help reflecting, after witnessing the death of a patient, say upon the fourth day of a restless and exhausting delirium, that had sleep been induced by any means, even by chloroform, a short time before the fatal termination was due, a different result might have been obtained. Had the patient lived for another hour, possibly sleep might naturally have occurred, and the question in such terribly serious cases is, can sleep be artificially induced at even a brief period before it naturally might fall due? This seems so highly probable that one must be undertaking a very serious responsibility who would withhold all narcotics or hypnotics from a patient sinking from the exhaustion caused by a restless delirium and want of sleep.

At the same time it must be remembered that many deaths have been attributed to the free use of the narcotic, and that Wilks stated he had seen many cases of delirium tremens sent to their last sleep by opium.

The physician thus finds himself placed in a grave difficulty, when dose after dose of narcotic fails to induce sleep in a patient apparently sinking from the exhaustion which sleep would soon banish.

The difficulty is made no less by the knowledge that owing to the state of the digestion and absorption these doses may lie in the stomach or intestines unabsorbed for a time, and then may all rapidly enter the circulation at once.

Consideration of this last possibility should discountenance the administration of solid opium in delirium tremens.

Another plea for the use of narcotics in this affection might be made out by stating what the writer believes to be the fact in some cases, that when sleep does occur it is sounder and more lasting, and hastens the recovery of the patient.

If the judgment of the physician leads him to believe that a moderate hypnotic will be beneficial in a given case, he should not think of

giving it sooner than twenty-four or thirty hours after the onset of the symptoms.

Early restlessness and activity may be benefitted by full doses of bromides, and some advantage may be constantly observed where sleep has not supervened. The bromide of potassium in 30 grain doses, often calms perceptibly the excitement of young subjects.

Of all the hypnotics used none is so dangerous as chloral, though this was the drug considered by Anstie to have the power of cutting short the disease, and the drug for which he thought there was a marked tolerance in delirium tremens. The writer has seen it tell with fatal rapidity upon the heart in the disease under consideration, and he has long since ceased to prescribe it.

40 minims of laudanum or liquor morphine (1 : 100) may be given about the sleeping hour of the patient upon the second night of his attack, and if sleep does not follow it should not be repeated till the early hours of the morning, and not again until bedtime the following night. Should the state of affairs be the same upon this night as upon the second, one dose of 30 minims may be given early upon the fourth morning. If sleep does not supervene by the fourth night (say seventy-two hours after the onset of the disease), the situation will become serious, and the full dose may be again repeated, to be followed by 20 to 30 minims every four hours until sleep comes on. Should excitement follow each repetition of the opiate, its administration should be suspended and it has been long observed that rapid improvement often follows one or two doses of tartarized antimony ($\frac{1}{8}$ to $\frac{1}{4}$ grain).

It is advisable to clear the bowels out by a smart purge before beginning the opiate treatment, and if the physician suspects that the remedy is not being absorbed, he may give a corresponding amount by the hypodermic needle when the next dose falls due in four hours.

Paraldehyde in 60 minim doses, and sulphonal in 40 grain doses, have been used to great advantage, and many physicians of late years are content to treat all cases with one or other of these drugs. They are, moreover, perfectly safe in the above-mentioned doses.

Hyoscine hypodermically ($\frac{1}{100}$ grain) has been tried as a hypnotic, and has given splendid results in delirium tremens. Merck's preparation only should be used.

Digitalis, in very large doses, has been freely given, and it is rather surprising to find that a heavier mortality has not been reported after doses of 240 minims of the tincture every four hours. These heroic doses have, unfortunately, been followed by some dangerous symptoms which may have the effect of preventing the administration of the drug in delirium tremens. It is, in reasonable doses, a most valuable remedy where there are signs of cardiac failure, but to be of use it must be given early, as the slowness of its action, which is often overlooked by physicians, renders it of little use in *sudden* failure of the cardiac muscle.

Strychnine acts much more quickly, and has an antagonistic action

to alcohol. (See under Alcoholism.) The tincture of nux vomica may be given in doses of 15 minims every four hours with 7 minims of tincture of digitalis, and, where cardiac failure threatens seriously to cut off the patient, in addition to the free use of whiskey with ammonia, as already mentioned, it is a good practice to give a large hypodermic dose of strychnine; $\frac{1}{12}$ grain will be enough, and may be repeated in three hours. Hot mustard poultices to the cardiac region and spine should be used at the same time.

Capsicum, in 20 grain doses, has been strongly recommended to produce sleep, but the writer has been disappointed in the results obtained by it in hospital practice, and, if there be any chance of acute gastritis supervening upon the debauch which led to the attack of delirium, it might possibly do serious harm by adding fuel to the fire. Nevertheless, good results have been reported in the hands of reliable authorities.

Belladonna, hyoscyamus, arnica, sumbul, lupulin, stramonium, and many other remedies of the same class, have been used with varying success.

Albuminuria may indicate kidney lesion, which seriously complicates the attack, and uræmic convulsions may occur. They should not be mistaken for epileptic seizures, which also often occur. A convulsion coming on, accompanied by a large amount of albumin in the urine, should be promptly treated by saline purgatives and a hot mustard pack. (See Bright's Disease.)

Complications, as they arise, must be treated upon the general principles mentioned under the head of each. As a rule, they are an indication for stimulants. Pneumonia is especially serious.

Delirium tremens, the result of an injury or accident in intemperate and irregular living subjects, is very common in the surgical wards, and generally turns out a grave affection. It may come on with alarming rapidity, and it is the writer's experience that the delirium in these cases is often of a more active and dangerous kind, and free stimulation is much more frequently indicated in this group of cases than in the ordinary medical varieties of the disorder.

DEMENTIA.

In the acute variety of this affection much can be done by judicious treatment. The essence of all treatment lies in forced feeding, and if carried out systematically and persisted in, even when the case appears hopeless, great improvement and even permanent cure often results. The food should be given in the liquid form, and, practically, in unlimited amount. By the India-rubber tube of the stomach pump 6 to 8 pints of peptonized milk may be put into the stomach daily. This may be prepared by using Fairchild's peptonizing powders, or by dissolving 5 grains of pancreatin with 20 grains of sodæ bicarb. in 1 ounce of water, and adding the solution to 1 pint of milk, which should

be kept for one hour at 110° F. Gruel may be peptonized in the same way by adding the same solution and digesting for one and a half hours, after which it should have a rapid boil. Beef tea may be more successfully treated by adding liquor pancreaticus (½ ounce to a pint), after having previously added the soda, and then the compound should be digested at about 100° for a couple of hours, and used immediately.

Rectal feeding may be necessary in extreme cases.

There is, however, no remedy like massage, but this should only be attempted when the forced feeding is being freely carried out.

Malt extracts, cod-liver oil, iron, quinine, or bark, with dilute nitro-hydrochloric acid, alternating with small doses of arsenic, may be given with great advantage.

Stimulants should, as a rule, be freely given at first till the activity of the alimentary canal and the nervous system be roused from its torpor by the increased nutrition.

The constant current, twenty Leclanché cells, may be applied to different parts of the body for a period of fifteen minutes twice daily, and static electricity has a powerful influence over the general nutrition.

The patient's body should be enveloped in thick flannels, and artificial warmth is almost always required.

Where the dementia is secondary to some brain disease or functional disorder, the treatment of the original affection is indicated.

DENGUE.

A smart purge should be administered at the beginning of the attack, but the older methods of treating this specific fever by constant purgation is now abandoned. One good dose of calomel generally will be found sufficient.

Quinine in 5-grain doses may be maintained as long as the temperature keeps high, and it probably may be found that the new antipyretics will be of value, especially as the initial fever is short and sharp. Sometimes the cold pack, or douche, or sponging must be resorted to when 105° F. is reached. Lately, salicylate of soda has given good results.

Belladonna has been found of great use for the relief of the joint pains, and may be combined with opium, thus : 10 minims each of laudanum and tincture of belladonna may be given every two or three hours for four or five doses with marked benefit. After the subsidence of the acute symptoms, bromides and iodides are valuable, though generally anti-rheumatic remedies afford little relief to the arthritic complications. The convalescent stage may be managed upon the general principles indicated in the treatment of our own specific fevers.

DENTITION, Disorders of.

A great deal of importance has been attached to the conditions often found associated with or attributed to the eruption of the milk teeth, and various disorders having nothing whatever to say to dentition are being constantly brought before the physician as cases of delayed or irregular teething. Nevertheless, it is a daily matter of observation that certain symptoms appearing at this period demand prompt treatment.

Convulsions may be fairly traced to this source, and under that heading the indiscriminate scarification of the gums has been dwelt upon, and the evils resulting therefrom mentioned. (See Convulsions, page 149).

The chief indications for the treatment of the various combinations of symptoms noticed at this period in young children may be easily decided by a study of the mechanism causing these disturbances. The very marked impressibility of the different nerve centres in the young child, owing to developmental causes, renders any peripheral irritation liable to be followed by phenomena more or less general. This impressibility of the nervous system may be controlled or altered by drugs, and there are few conditions in which more immediate and striking relief may be harmlessly obtained. Opiates should not be employed; the relief they afford is dearly purchased, as they leave the nerve centres still more susceptible to impressions which in the normal condition give rise to no reflex manifestations.

Bromides are invaluable, and no harm can follow the administration of full doses of the potassium or ammonium salt. In some way, not so easily understood, the domestic remedy—nitrous ether—has a decidedly beneficial effect. The writer guesses that its soothing influence depends upon its power of causing dilatation of the small vessels; Professor Leech has shown that in full doses it reduces arterial spasm in angina pectoris. It appears to do good also in causing the skin to act, and thus relieves the irregular fever so constantly found associated with symptoms depending upon delayed dentition. Peevishness, restlessness, wakefulness, muscular twitchings, night terrors, vomiting, diarrhœa, and the characteristic series of teething troubles often rapidly yield in an infant of about twelve months old to the following simple combination:

℞.—Ammon. bromidi		gr. xxx.
Spt. ætheris nitrosi		ʒj.
Liq. ammon. acet.		ʒiv.
Syr. simplicis		ʒiv.
Aquæ cinnamoni	 ad	ʒij.—M.

S.—Take a teaspoonful every two hours.

The bowels should be cleared out by a teaspoonful of castor oil, preceded by a dose of 1 grain of gray powder. It is a good plan to give

the mercurial in a teaspoonful of syrup of senna, and to omit the oil. The senna can be repeated without the gray powder ever four hours till the bowels act. It is easily taken by all children.

DIABETES INSIPIDUS.

The treatment of this affection is very unsatisfactory, and though many drugs have been used, and successes unquestionably recorded, nevertheless the drug which benefits one case will have no effect whatever upon the case next presenting itself, and we have no real knowledge of the pathology of the affection. Hence the treatment here mentioned can only be a brief list of the drugs or remedies which have been given with very decided benefit in some cases.

The continuous current has been used in different ways. A strong current is employed, and the best method appears to be by placing the positive pole on the nape of the neck, and the negative over the loins and pit of the stomach, alternately, for four or five minutes at a time.

Some physicians have contented themselves with a weak current, and have passed it through the base of the brain.

Seidel found very marked improvement by placing one pole over the loin behind, and the other deeply pressed into the corresponding hypochondrium, galvanizing each side daily for five minutes. In some six or eight weeks of this treatment the urine was found to have fallen in daily amount from about ten pints to a little over three pints, the weight of the body rising by nine pounds. The amendment, according to Roberts's report, had been maintained at the end of three months. In many cases this treatment has signally failed.

Antipyrine has been reported as markedly successful in several cases recently in the hands of Opitz. The daily dose should begin with 30 grains, steadily increased till 90 grains are reached.

Trousseau's great remedy was valerian in enormous doses. He administered a drachm of the extract three times a day, and in one case he gave one ounce daily.

Roberts had seen great benefit from the valerianate of zinc in one case of a boy, in which he saw the daily quantity of urine fall from fifteen to five pints after doses pushed to the extent of 20 grains daily. Dr. Lindsay has reported successes after the administration of the extract of valerian. Murrell found a case following a fall upon the head to yield to a course of belladonna and ergot.

Nitrate of potash has proved very valuable in several cases when given in half-drachm doses.

Iodide of potassium and iodide of mercury have been tried with success in a few cases.

Bromide of potassium was tried by the writer in a case with striking benefit, but the condition had lasted such a short time that there would be grounds for doubting that it was one of diabetes insipidus.

Roberts, noticing how often the disease was relieved by the presence

of some intercurrent inflammatory affection, was led to apply a large blister to the pit of the stomach with some benefit.

Dilute nitro-hydrochloric acid, in drachm doses, has been reported to have cured several cases.

Opium, morphine, codeine, and other narcotics do harm. Iron, strychnine, chloride of gold, gallic acid, ergot, creasote, alum, belladonna, muscarine, pilocarpine, cream of tartar, and many other drugs have been used with very variable success. Some cases are upon record where, after failure of all drugs tried, rapid improvement has followed a change of air to the seaside.

Warm clothing should be insisted upon, and the general health carefully looked after, signs of emaciation being treated by cod-liver oil, and the usual remedies applicable in the treatment of wasting diseases.

A diet of dry or solid food with little liquids always causes rapid diminution in the amount of water passed, but produces such intense discomfort and depression that, as a method of treatment, it has to be soon abandoned in each case.

DIABETES.

The most important portion of the treatment must be a well-regulated diet. If this be not most rigorously attended to, drugs will avail little. The physician will always keep before him the main object of furnishing for the patient a dietary as far as possible containing the least amount of sugar or starch, or substances easily convertible into sugar. But no two cases of the disease will thrive best upon an exactly similar diet table, and in this comes in the secret of treating the affection successfully. By daily estimation of the amount of sugar voided in the urine, and by weighing the patient at short intervals, the diet may be adjusted from time to time, so as to make life comfortable, and in many cases lead to a complete and permanent cure. The amount of sugar excreted will often convince the physician that some articles can be taken with safety and benefit by one patient which may seriously increase the disease in another.

The best method for practical purposes of estimating the daily excretion of sugar is the one introduced by Sir William Roberts. It can be carried out by any intelligent patient (whenever it is wise to trust a patient with the details of his own ailment).

The following are Sir W. Roberts's own words:

"About 4 ounces of the saccharine urine are put into a 12 ounce bottle, and about the size of a small walnut of German yeast is added to it. The bottle is then covered with a nicked cork (which permits the escape of carbonic acid), and set aside on the mantel-piece or other warm place to ferment. Beside it is placed a tightly corked four-ounce phial filled with the same urine without any yeast. In about twenty-four hours the fermentation will have ceased, and the scum cleared off

or subsided. The fermented urine is then decanted into a urine-glass and its specific gravity taken. At the same time the density of the unfermented urine in the companion phial is observed, and the "density lost" ascertained. Fermentation is generally complete in about eighteen hours, if the locality be sufficiently warm; and it is desirable to remove the two phials into a cool place two or three hours before the densities are taken, in order that they may attain the temperature of the surrounding atmosphere."

The difference between the two densities—*i. e.*, the density *before* and *after* fermentation—will give the number of grains of sugar in each fluidounce of the urine. Thus, suppose that the unfermented sample by the ordinary urinometer registers sp. gr. 1050, and that the fermented sample registers sp. gr. 1020, the urine for all practical purposes may be regarded as containing thirty grains of sugar per fluidounce.

By multiplying the total number of ounces passed during the twenty-four hours by thirty, the total amount of sugar in grains will be easily obtained. Thus the physician will have an easy and accurate method, by means of which he can determine the result of dietetic and medicinal treatment, without which he would have to grope his way in the dark a great deal.

In selecting a diet, the following must be avoided: Most vegetables (exceptions will be afterward enumerated), especially potatoes, turnips, cauliflower, carrots, peas, beans, parsnips, sea kale.

Fruits—especially all sweet fruits—apples, oranges, pears, gooseberries, currants, plums, and peaches, must be forbidden.

Farinaceous food must be strictly avoided, thus, corn-flour, bread, rice, sago, macaroni and vermicelli, tapioca, sweets, pastry, puddings, etc.

Of the articles allowable, nearly every animal substance may be freely partaken of—any kind of meat, game, fish, or poultry; indeed, the only animal products which are injurious and must be avoided are liver, molluscs, and honey.

In the cooking of animal substances, strict attention must be paid to the avoidance of adding any starchy or saccharine flavoring ingredients to the meat. Green vegetables, cabbage (when quite green), lettuce, cress, spinach, water-cress, celery tops, endive, young Brussels' sprouts, spring onions, French beans (when *quite* young), and *green* artichokes may be allowed in moderate quantities.

Cheese, cream, butter, and eggs may be used in fair quantities. The question of milk will be considered afterward.

There is, after all, but one difficulty in the treatment of diabetes by diet, and that is the question of bread. To provide a substitute for it which will contain neither starch, sugar, nor anything easily changed into sugar, and which will, at the same time, be both palatable and capable of sustaining life, is the great desideratum.

Bran made into cakes by Camplin's method, with eggs, butter, and a little milk, are used.

Gluten bread, made from carefully washed gluten, in which as little starch as possible is left, is, if made carefully, a palatable substitute.

The writer has had much satisfaction from the use of gluten buns.

Dr. O'Donnel gives the following formula for diabetic bread: Beat six eggs with a teaspoonful of baking-powder, add a quarter of a teaspoonful of salt, beat again, pour into hot waffle-irons smeared with butter, and bake in a very hot oven.

The following is Woltering's recipe for gluten bread:

The bread is, he says, most conveniently and easily made with baking-powder. Mix one and a half heaped tablespoonful of baking-powder with one pound two ounces of gluten meal, and rub the mixture through a sieve; rub up well in a bowl till thoroughly mixed, and work into a dough with half a pint of lukewarm water. It is now ready to be put in baking-tins and baked in a hot oven. It may also be made with yeast. Mix the same quantity of gluten meal with one halfpennyworth of "German" yeast dissolved in a few tablespoonfuls of warm water, and work into a dough with a quarter of a litre of lukewarm water. Put the dough, which is as sticky as glue, in warmed and buttered baking-tins; it will rise in from one and a half to two hours. Bake for from one and a half to three hours in a hot oven; turn every hour. The bread ought to have a hard, brittle, brown crust and a light-gray crumb. Like all gluten bread, it has a sour taste, which is not altered by the addition of egg, milk, butter, or bicarbonate of soda to the dough. Saccharin gives at unpleasant, sweet taste. Cream corrects it better than anything else, but it is not noticed if the bread is buttered and eaten with some savory, such as a sardine. After one or two days the bread remaining grows tough; and should be toasted or cut into fingers and baked in the oven until brittle. This toasted bread is palatable with butter, or may be crushed and used for making puddings. The bread made with yeast contains 53.9 per cent. albuminoids, 0.2 per cent. fat, and 2.6 per cent. carbohydrates.

The writer has had several poor diabetics kept alive upon home-make bread, prepared by themselves from the crude gluten obtained from the starch works. This compound is far from being a proper diabetic food, but, among the poor diabetics discharged from hospital as incurables, it is the best that can be done for them. He directs them to take four breakfast-cupfuls of the finest bran, and a small teacupful of the best white Indian flour or meal, and rub these with six ounces of butter and a teaspoonful of bicarbonate of soda. This mass is then made into dough with the thick part of the washed gluten, which has been left to settle in a pail of water over night. The mass is to be rolled into cakes, and baked in a slow oven for two hours.

Pavy believes that there is no article of food better suited to the diabetic than the almond. Its highly nitrogenous and rich oily materials supply him with every want, and from it bread, buns, and cakes can be easily made, which are very palatable substitutes for bread.

Purdy also speaks strongly of the almond flour, and shows that it

should be prepared fresh, because of its speedy deterioration, owing to the 50 per cent. of oil contained in it. Rubbed up with eggs and well beaten and a little baking-powder added, it may be baked in small tins in any good oven without difficulty.

The objection to gluten is that it always contains more or less starch; to bran, that beyond the carbohydrates there is little else in it to nourish; to the almond bread, there is no objection save that of expense.

Soya bread has come into repute. It is made from the grain of a leguminous Eastern plant which has been successfully cultivated in Austria. Like the almond, it contains much fat, and there is but a trace of starch found in it. It makes a bread not unlike rye bread, of which diabetics do not soon tire.

Danype's bread is made with flour obtained from the embryo of wheat, after the separation of its starchy endosperm. It is being used in France for diabetics, and it is free from starch save in the merest traces.

Fürbinger's gum bread is much used in Germany. It is made by Basserman, of Manheim.

Tea, coffee, and cocoa made from nibs, may be freely partaken of, sweetened with saccharin or glycerin, and containing good cream. There is little use in trying to diminish the amount of fluid consumed, and thirst may be assuaged by acidulated drinks made with cream of tartar, phosphoric acid, or lactic acid.

Stimulants should be most sparingly used, and, when given, should consist of whiskey, or a little dry sherry, or very bitter ale. Sweet wines are decidedly injurious.

The patient's hours should be very regular, and he should, as far as possible, be saved from bodily fatigue, worry, or heavy brain-work. Against changes of temperature he should be provided, by being well clad in flannel, and should wear thick-soled boots. Gymnastic exercises may be advised, when weather and other contra-indications forbid exposure.

Before passing to the treatment by drugs, mention may be made of Donkin's method of treating diabetes by an exclusive diet of skimmed milk. About one gallon or more is the daily allowance. This treatment has met with pretty general condemnation, and most of the recent writers seem puzzled to account for Donkin's results. Notwithstanding these adverse opinions, there will be met with classes of cases where really no other dietetic treatment is available. The writer has seen, in at least three cases, the most decided benefits follow this method. In one (a fat patient) the sugar disappeared entirely, returned after the milk was stopped, and disappeared as long as it was adhered to. In poor patients who turn up at hospital, and who may gain admission for a few weeks or even months, when they are compelled to leave and return to their homes, milk is really about the only available safe diet for them. Severe cases of diabetes will, unfortunately, be often

found where milk acts most injuriously; but fat patients sometimes do well upon it.

In agricultural districts buttermilk turned acid is a very valuable diet for the poor diabetic. In such cases bread, when stale, may be cut into very thin slices and toasted before the fire until browned or partially charred through, when it may be found that much of the starch is destroyed, and, when well coated with butter, can be eaten with comparative safety.

Too much cannot be expected from a pure dietetic treatment of the disease, and though, now and then, the physician may meet with a case where the sugar disappears entirely; nevertheless, in young subjects especially, the sugar can sometimes be very little influenced by diet.

In every case there are various drugs which may be employed with more or less benefit, though the drug which is to exert a specific action in diabetes has yet to be discovered.

Opium comes foremost amongst these. It can be tolerated in very large doses. The watery extract, in doses of $\frac{1}{2}$ grain, three times a day, may be started with, and the dose need not generally be pushed beyond 3 or 4 grains.

Morphine may be employed in proportionately smaller doses; but codeine will be found to possess some advantages over opium or its other alkaloids, though Fraser and Bruce strongly believe in the superiority of morphine.

Codeine is less likely to cause disturbance from its narcotic action, being a much weaker narcotic than morphine, and the good which opiates unquestionably accomplish in diabetes is altogether independent of their anodyne properties, and Bruce has shown, when they are exercising their best effects in diabetes, that narcotic symptoms seldom are manifest. Fraser insists that codeine should simply be regarded as weak morphine. The dose of codeine may commence with $\frac{1}{2}$ grain, increased to 2 or 3 grains, three or four times a day. It will be found not to interfere with digestion, and is always well borne. Under its influence the amount of sugar generally markedly falls in a few days. Fraser found that the therapeutic value of 1 grain of morphine daily in diabetes exceeded that of 15 grains of codeine.

In cases where the codeine treatment with strict diet fails, any of the following drugs may be tried. The list might be much further lengthened out, as nearly every remedy has got a turn in the management of this serious ailment.

Antipyrine is placed next in value to opium and its alkaloids, and some recent observers go so far as to state that it possesses more influence over the diabetic process than these agents. It must be given in full doses, *i. e.*, 10 grains, four or five times a day, to be suspended as soon as any albuminuria appears.

Phenacetin, antifebrin, exalgine, and the other members of the same class, appear to have a similar but less certain effect.

Carlsbad waters drunk freely at Carlsbad, in conjunction with strict dietetic treatment, until the urine becomes alkaline, with or without the opium or morphine treatment, has given most satisfactory and lasting benefits in many cases. It would appear that the Carlsbad waters have been proved to be more effectual than the other natural alkaline waters—as Vichy, Neuenahr, Fels, or Vals—and it is insisted by those at the place, that the drinking of the water at its source is much more efficacious than undergoing the treatment at home.

Alkalies have been much used, and the good effects of the Carlsbad water is doubtless owing to their presence. The waters of Vals and Vichy are, no doubt, of value in some cases. The alkaline carbonates and ammonia phosphates, the citrates of soda and potash and free ammonia, or its carbonate or acetate, have been pushed, but apparently with very little influence upon the amount of sugar. Alkalies and their carbonates are by Ebstein supposed to act by directly supplying carbonates and free carbonic acid to the protoplasm of cells throughout the body.

Saccharin has been vaunted as a cure. It is of great use as a substitute for sugar, but here its therapeutic virtues end. Large quantities are liable to upset the stomach, and by leaving a permanent sweet taste in the mouth may destroy the appetite. Almost the same may be said of glycerin.

Permanganate of potassium and peroxide of hydrogen have failed signally in the hands of most physicians.

Bromide of potassium, salicylic acid, cocaine, bromine, picric acid, calcium sulphide, lactic acid, large doses of quinine, uranium salts, lithia salts, creasote, and arsenite of bromine have been reported to have caused cures, but in other hands have almost always proved useless.

Jambul has given very promising results. The dose is 3 to 5 grains of the powdered seeds. Saunby, however, states that the drug is useless.

Rennet and pepsin have been used and found wanting, and Roberts has given strychinine and belladonna till their physiological effects have been evident without the least influence upon the sugar. Calabar bean and ozonic ether have proved to be comparatively valueless. Sugar and honey have been given with the idea of replacing the amount lost through the kidney, but with almost disastrous results.

Massage and electricity, quinine, cod-liver oil, iron, and laxatives of the castor-oil or cascara type, are generally useful in combating symptoms, or complications arising during the disease.

Martineau's specific, consisting of an aërated solution of arseniate of sodium and carbonate of lithium, has done some good as a nervine tonic and diuretic.

Dujardin-Beaumetz speaks very highly of this treatment, which he modifies in the following way: He gives 8 grains of carbonate of

lithium in a glassful of Vichy water, with 2 drops of Fowler's solution, before each meal.

Oxygen, pumped into water and given as an aërated beverage, has proved very beneficial in some cases.

The above seems but a small portion of the list of drugs whose praises have been from time to time sung in the treatment of diabetes. It would appear that many observers, when getting a case of diabetes, place it at once upon a diet devoid of sugar and starch, and any drug which their fancy induces them to try they prescribe, and often fall into the error of ascribing all the good effects to it alone.

The complications arising during the disease are to be treated upon general principles.

Coma should be promptly met by large doses of free alkalies, or the intra-venous injections of bicarbonate of soda solution.

Recently Reynolds lays great stress upon the necessity of very large doses of the citrate of potassium and great quantities of fluids to be swallowed by the mouth. He mentions a case where he was able to dispel approaching coma by ordering drachm doses every hour of this salt, and the administration of about two gallons of water in the twenty-four hours.

As soon as the daily examination of the urine shows that the dietetic treatment has failed to make any further reduction of the daily excretion of sugar, or when the greatly reduced amount begins to remain at a standstill, then the opium treatment may be commenced. It is a mistake to do this without previously ascertaining the daily amount of sugar by Roberts's method.

The diet should be carefully regulated from day to day, and as much variety as possible afforded to the patient. Much will depend upon this, for if the patient be allowod to become disgusted by the sameness of his diet he is sure to suffer.

When the sugar has disappeared, a few ounces of bread may be tried, and if no sugar appears this may be gradually increased; but sugar should not be allowed, no matter how small the quantity. Potatoes, until the urine has been long free from sugar, should not be permitted, though they are recommended as a portion of the diet by Dujardin-Beaumetz and others.

The profession is watching with the greatest interest the results of the brilliant researches being carried out by Professor Lépine, of Lyons, and already there is fair ground for hoping that the outcome of these will be the first step in a truly scientific treatment of this formidable malady.

The writer, in conjunction with Professor Brunton, had recently the privilege of witnessing some of the steps in these interesting experiments in the laboratory of Professor Lépine, and, though several authorities, including Arnaud and Sansoni, question his theory of the bipolar action of the pancreas, there is little doubt but a distinct

advance is being made since his discovery of a glycolytic ferment in the blood.

The physician will find a reference to the following diabetic dietaries, which are given in detail, along with much valuable practical information, in Yeo's book on "Food in Health and Disease," of the greatest advantage during the treatment of this serious and troublesome affection.

Pavy's Dietary.

The following articles are allowed:

Butchers' meat in every form except liver; bacon and ham; game, poultry; all kinds of fish, both fresh and cured, including the crustacea; animal soups (without thickening), including beef tea and broth.

Eggs, cheese, cream-cheese, cream, and butter.

Almond, bran, or gluten substitutes for ordinary bread.

Greens, spinach, turnip-tops, water-cress, mushroom, mustard-and-cress, cucumber, lettuce, endive, radishes, and celery.

In moderate quantity, after boiling in much water, are allowed:

Turnips, French beans, Brussels sprouts, cabbage, cauliflower, broccoli, sea-kale, asparagus, vegetable marrow; also, pickles, olives, vinegar, and oil.

Jelly, flavored but unsweetened; savory jelly, blanc mange, made with cream and not milk; custard, made without sugar.

Nuts of all kinds except chestnuts.

Tea, coffee, cocoa from nibs.

Dry sherry, claret, hock, dry Sauterne, Chablis, Burgundy.

Brandy and spirits, unsweetened; soda water, Burton bitter ale in moderate quantity.

The following are forbidden:

Sugar in any form, wheaten bread, and ordinary biscuits of all kinds.

Rice, arrowroot, sago, tapioca, macaroni, and vermicelli.

Potatoes, carrots, parsnips, beetroot, peas, and Spanish onions.

All kinds of pastry and puddings, and fresh or preserved fruits of all kinds.

Milk is forbidden, except in very small quantity, and also port wine.

Sweet ales, mild and old porter and stout, cider, liquors, and all sweat and sparkling wines.

Sir William Roberts's Dietary.

The following articles are allowed:

Butchers' meat, poultry, game, and fish.

Cheese, eggs, butter, fat, and oil.

Broths, soups, and jellies made without meal or sugar.

Cabbage, endive, spinach, broccoli, Brussels sprouts, lettuce, spring onions, water-cress, mustard-and-cress, and celery.

For bread is substituted—bran cake, gluten bread (and meal), almond meal, rusks, and biscuits; also, "Torrified" or charred bread.

Dry sherry, claret, bitter ale, brandy and whiskey in small quantities.

Tea, coffee (without sugar), chocolate (made with gluten meal), soda water, bitartrate of potash water.

The following are forbidden:

All saccharine and farinaceous foods, bread, potatoes, rice, tapioca, sago, arrowroot, macaroni, etc.; turnips, carrots, parsnips, beans, and peas.

Liver contains much sugar-forming substances, therefore oysters, cockles, and mussels, which contain enormous livers, are forbidden; as is, also, the "pudding" of crabs and lobsters.

All sweet fruits—as apples, pears, plums, gooseberries, currants, grapes, oranges, etc.

Port, and all sweet wines; sweet ales and porter; rum and sweetened gin.

Seegen's Dietary.

Any quantity of the following are allowed:

Flesh of all kinds: preserved (smoked) meats, hams, tongue, bacon.

Fish of all kinds, including oysters, shell-fish, crabs, and lobsters.

Animal jellies, aspic, eggs, caviare, cream, butter, cheese.

Spinach, cooked salads, endive, cucumber, green asparagus, water-cress, sorrel, artichokes, mushrooms, and nuts.

The following in small quantity are permitted:

Cauliflower, carrots, turnips, white cabbage, green beans.

Berries—such as strawberries, raspberries, currants; also oranges and almonds.

Beverages in any quantity are:

Water, soda water, tea, coffee, Bordeaux and Rhine and Moselle wines; Austrian and Hungarian table wines; in short, all wines that are not sweet, and that contain only a moderate amount of alcohol.

In very small quantities may be taken:

Milk, unsweetened; almond emulsion; brandy, bitter beer; lemonade, unsweetened.

The following are forbidden:

Farinaceous foods of all kinds (bread only in very small quantity, according to the discretion of the physician), sugar, potatoes, rice, tapioca, arrowroot, sago, groats; peas, beans; also sweet fruits, as grapes, cherries, peaches, apricots, plums, and all kinds of dried fruits; champagne and sweet wines and beers, must, fruit wines and fruit juices and syrups; sweet lemonade; liquors; ice and sorbets; cocoa and chocolate.

Cantani's Dietary.

The following articles are allowed:

Meat and animal fats of all kinds (at all meals), chopped pancreas cooked in bacon fat.

Fish of all kinds, lobsters; olive oil (instead of butter), eggs (in milder cases).

Pavy's almond cakes are substituted for bread (only for convalescents, who cannot entirely dispense with bread).

Pure water, soda water; persons habituated to the use of strong wines and spirits may add to the water 10 to 30 grammes of pure alcohol daily. Red wine, tea and coffee in milder cases.

The following are forbidden:

Liver; butter, as it contains traces of lactose; cheese, milk, all farinaceous and saccharine foods absolutely; all fruits and green vegetables and roots.

Much salt or much pickled pork or salt fish.

Lemonade, chocolate, vinegar, rum and Cognac, tea and coffee in severe cases.

Germain Sée's Dietary.

The following articles are allowed:

All kinds of animal flesh, boiled or roasted; ham, bacon; all kinds of fish, crustacea, oysters; eggs, cheese (well-kept); fats of all kinds, butter, lard, and sauces without flour; 5 ounces of bread or potatoes daily, also roots and green vegetables. Saccharin to replace sugar.

Wines that are not sweet, and tea and coffee without sugar. Vichy water is recommended before meals, especially in gouty cases.

Milk, as a general rule, is forbidden.

Bouchardat's Dietary.

The following articles are allowed:

All kinds of meat (150 to 200 grammes of fat daily), cooked in any way, but without meal or sugar.

All kinds of fish; lobsters, crabs, oysters; snails; eggs and cream; cabbage, lettuce, spinach, artichokes, asparagus, green beans, etc.; peaches and strawberries.

Gluten bread is to be substituted for bread.

As a beverage—claret or Burgundy, to the extent of 1 pint to 1½ pints daily, is allowable.

Milk is forbidden, and also all substances rich in carbohydrates.

Ebstein's Dietary.

For early breakfast he allows one cup of coffee or tea (black), without milk and sugar; white bread toasted, 30 to 50 grammes; or brown

bread, well buttered—butter 20 to 30 grammes. The yolk of an egg; a little fat ham, or some German sausage (if required).

If any food be required between this meal and dinner, let it be a cup or broth, with the yolk of an egg.

For dinner he allows—broth, with yolk of egg or marrow (the marrow-bone is boiled for half an hour to solidify the marrow). Some peptone may be added to the broth.

Meat (180 grammes, free from bone), roasted, boiled, or stewed—beef, mutton, pork, veal, fowl, or venison (fat meat preferred). Gravies, with cream or yolk of egg, not flour. Or fish, with melted butter.

Vegetables, prepared with much fat; purées of leguminous plants. Salads, dressed with vinegar and oil, and some cream. The food should be well salted and spiced.

After dinner a cup of coffee or tea.

For supper are allowed one cup of tea or broth, meat roasted, ham or cheese, or an egg, or fish, caviare, bread (30 to 50 grammes), with butter (20 to 30 grammes). Apples, pears, and stone fruits are allowed in small quantities.

Beer is forbidden, and the use of spirits is limited. Half a bottle of wine daily is allowed. If the patient digests milk well, he is allowed it in moderate doses, and cream especially.

Dühring's Dietary.

Burney Yeo points out that this dietary differs from most others, and is founded on the theory that the most important factor in the causation of diabetes in a faulty diet and disturbed digestion. Dühring, therefore, insists only on a restricted diet, and the selection of the most digestible foods.

For early breakfast are allowed milk, with a little coffee, but no sugar (some lime water to prevent milk from becoming sour in stomach), stale white bread *ad libitum*, or oatmeal, barley, or rice gruel, made with water, a little salt, but no butter (if bread cannot be borne).

For second breakfast are allowed white bread, stale and well baked; an egg lightly boiled, rice or oatmeal gruel, with or without milk (a breakfast-cupful) or half a glass of good red wine (with water in certain cases).

For dinner (taken between two and three o'clock) are allowed soup, with rice, barley, or oatmeal; meat, roast, 250 grammes (game, ham, and smoked meats, as free from fat as possible, are permissible); no condiments, no fatty sauces.

Compôte of dried apples, plums, cherries, dried peas or white beans in some cases, green vegetables, asparagus, French beans, carrots, cauliflowers, cabbages (boiled in water with salt, not with fat or stock).

Dessert of a little raw fruit, apples, cherries, and one small glass of red wine, diluted with water.

For supper (about 7 P. M.) give gruel of barley, oatmeal, or rice,

with salt (but no butter), and strained; in some cases may be made with milk. Ice or iced water, to relieve thirst between meals.

He lays great stress on the mode in which these vegetable foods are prepared, especially the cereals used for making gruel, and the legumes are, before being cooked, to be steeped for some time, and boiled long enough to make them more easily digested.

DIARRHŒA.

This condition must not be regarded as a disease. It is but a symptom of various affections of a widely different nature, and the first duty of the physician before treatment is begun is to try and find out the cause of the condition. There can be no worse practice than to administer opiates in every case of diarrhœa, or to follow the routine practice of pouring down drenches of chalk and catechu or other astringents. It is a well-known fact, and by no means infrequent in occurrence, that severe and persisting diarrhœa may be produced by a mass of old feces lying in the large intestine, and in elderly people this cause should always be looked out for.

Most of the cases of acute diarrhœa met with in practice may be classed under the head of "irritative." They follow some indiscretion in diet, and especially in adults, may be safely regarded as if the patient had taken a cathartic which was irritating the small intestine, causing sometimes intense griping and smart purging. Such cases will require little treatment, and certainly should not be checked at first. The diarrhœa is Nature's method of getting rid of a poison introduced from without in the food, or generated within the bowel, and if the physician must interfere, it may be best to assist Nature, and give a mild dose (2 drachms) of castor oil, or a teaspoonful of Gregory's powder (pulv. rhei comp.). The severe pain is best combated by a large dose of whiskey or brandy, or 5 minims of oil of turpentine or other essential oil.

Salines, though often employed, are not, in the writer's opinion, suitable in these cases. They increase the pain, and, by rendering the motions quite fluid, may sweep past and not remove the source of irritation.

This form of diarrhœa is very common in children fed upon cow's milk, and the early diagnosis of it will enable the physician to often save life. It can be recognized at once by an examination of the infant's napkins, or by a description of them when not available for inspection. The motions consist of masses of undigested curd closely resembling glazier's putty in appearance and consistence, these masses can be easily shaken off or detached from the napkin which they scarcely soil. They are often green in color and are passed solid, with a little acrid watery discharge often mistaken by the nurse for urine. Here the employment of vegetable astringents or opiates means delay, and too often death.

The first symptoms may be rapidly followed by vomiting, and if the

cause be not promptly removed, a low and fatal form of enteritis sets in which is beyond the reach of drugs. The symptoms are so treacherous that before the physician is summoned this may already have taken place. The cow's milk should be instantly stopped, and a healthy wet nurse obtained. When this cannot be accomplished without delay, which is usually the case, two courses are open. Raw meat, grated or pounded to a pulp, may be given or made into strong beef tea; or Nestlé's milk food should be tried. In emergencies of this kind, the writer is satisfied that there is no other food will give such good results. He has used it since its introduction into this country in 1873, and believes he has often seen it save life, which otherwise would have been lost. Directions must be given that no cow's milk should be administered until long after the attack is passed, and then only in very small amount, and but once a day at first, watching its effects.

It is upon the whole better never to return to it if the attack has been a serious one. As soon as the child takes to the new food, a smart dose (one teaspoonful) of castor oil should be given to clear any indigestible curds out of the bowel. No further drugs are needed in the majority of cases.

Meigs's milk and cream food is an excellent diet, and when cow's milk must be returned to, it is the safest. A child six months' old may have the following modified formula. The lime-water may be replaced by solution of bicarbonate of soda (3 grains to 1 ounce):

℞.—Pure fresh milk	3 parts.
Cream	$1\frac{1}{2}$ "
Lime-water	1 part.
Sugar of milk	$\frac{1}{3}$ "
Boiled water	2 parts.—M.

Of a different nature altogether is a form of irritative diarrhœa, occurring in infants or children a little older, but still very young, and known as summer diarrhæa. Here also the milk—generally cow's milk—is at fault, and there can be little doubt that the irritant is a microbe or ferment which secretes a highly poisonous principle, causing profuse and frequent liquid motions, so that severe cases are spoken of as cholera infantum.

It is unfortunate that these names are used in different senses by different writers, thus irritative diarrhœa is often called inflammatory. The irritative diarrhœa caused by curds of milk in infants is sometimes spoken of as a "simple" diarrhœa, but if it passes on into entero-colitis it becomes an inflammatory diarrhœa.

The treatment must be the immediate withdrawal of the milk diet, and the copious administration of ice or iced water with a purgative; after which Nestlé's food, prepared fresh every time, or sterilized cow's milk may be given, provided it is clear that prior to the attack there

there was no evacuation of the firm, dry putty-like masses before described. Castor oil is the safest purgative in these cases; the following old-fashioned combination is an excellent one, and a child one year old may get a powder twice a day.

℞.—Sodii bicarb.	gr. iv.
Pulv. rhei	gr. jss.
Pulv. cinnamomi	gr. j.—M.

Sterilized milk is a perfect safeguard against ordinary summer diarrhœa, or the more severe cholera infantum, which is probably caused by some pathogenic microörganism.

It can be best sterilized by being boiled upon a water-bath in small bottles for fifteen minute. The writer has long been in the habit of having all tubes and bottles soaked in a strong solution of boric acid, and he advises a few grains to be added to each pint of milk as it comes fresh from the cow in summer weather.

There is no doubt in the mind of the writer that tubercular disease is communicated often through the milk of cows with tubercular deposits in the mammary gland, and it is a wise measure to always sterilize the milk of bottle fed children for more reasons than one.

Bismuth, or chalk mixture, with occasional purgatives, the best of which is castor oil, is harmless. The following is a good routine formula after the diet has been made right; it may be freely given to a child one to two years old:

℞.—Bismuthi subcarb	gr. xlv.
Tinct. opii camph.	ʒj.
Glycerini	℥ss.
Mucil. acaciæ	℥ss.
Aquæ cinnamomi	ad ℥iij.—M.

S.—A teaspoonful to be administered after each loose motion.

This mixture may be used for a child four years old, by doubling the amount of bismuth and trebling the camphorated tincture of opium.

Naphthalin has been used with much success on the Continent. The rationale being that it destroys, in the intestinal canal, the putrefactive or pathogenic microörganisms which cause the diarrhœa; it also stops fermentation. It may be given in doses of ½ to 2 grains, four times a day, to two year old children in sugar or wafer paper, and this dose may be increased to 5 grains for children six to eight years old, and has been found by Rossbach to be valuable in cholera infantum.

Salol acts equally well. A child, six months old, may get 2 grains three times a day.

Salicylate of sodium, in slightly smaller doses, may be adminis-

tered with half a minim of ol. menthæ pip. with the same objects in view.

Resorcin, carbolic acid, creasote, corrosive sublimate, salol, eucalyptus, glycerin of borax, lactic acid, and iodoform have been successfully employed by different physicians, with the view of acting as intestinal disinfectants, and promise to supercede the old-fashioned and irrational method of pouring in opium, catechu, kino, logwood, rhatany, acetate of lead, copper, sulphate of iron, and many other so-called astringents.

For the frequent green, foul motions of inflammatory diarrhœa, there is nothing better than 1 grain of calomel given in doses of $\frac{1}{6}$ grain every hour, for six doses, to a child one year old.

The writer has had no experience of Illingworth's treatment, which is so favorably reported upon by many observers. It consists in the administration of $\frac{1}{50}$ grain doses of the biniodide of mercury dissolved in iodide of potassium, and combined with doses of 1 grain of choral.

Irrigation, by inserting a soft rubber catheter into the stomach, and washing out until the tepid water used begins to return clear and sweet, and afterward adding a *trace* of corrosive sublimate to the water, has been successfully employed. Opium, chlorodyne, chloral, belladonna, cannabis indica, chloroform, and camphor may be given to relieve pain, check spasm, and diminish increased peristaltic action, in appropriate doses.

Where the seat of trouble is in the great intestine, disinfectants do not reach it, and then Babcock's plan of passing up a large, soft rubber catheter through the anus, and injecting large enemata of rather hot sterilized water, is an excellent one. Rice recommends glycerin enemata.

Where the attack has lasted for a considerable time in the child or adult, the same treatment may be carried out, employing the drugs in larger quantity, and given opium more freely to relieve the increased peristalsis. Half drachm doses of bismuth, with 5 grain doses of the pulv. morphinæ comp., may be given to adults every six hours.

Compound decoction of aloes, B. P., has a very striking effect in diarrhœa. It may, in one full dose (1 drachm to an infant, 1½ ounces to an adult), cause a firm, natural motion where watery stools have been the rule for many days, and it can be administered safely in the worse cases, as a morning dose, when the ordinary astringent remedies are being administered during the day. The writer has obtained better results from this drug than from any other after the very acute symptoms have subsided.

Chronic diarrhœa may exist long after the irritants which caused it have been swept away. After free purgation by the dec. aloes comp., astringent tonics, as the astringent iron salts, may be freely given after the diet has been carefully regulated. The pil. plumbi cum opio may be given every four hours in doses of 3 grains. The acetate of lead may be given every four hours in doses of 2½ grains, or ½ grain

of copper sulphate may be administered in pill. A favorite combination is the following:

℞.—Tinct. catechu comp. ℥iv.
Tinct. kino ℥iv.
Tinct. opii ℥ij.
Spt. camphoræ ℥ij.
Mist. cretæ ad ℨvj.—M.

S.—Take two teaspoonful every four hours. Shake well.

The following, among many other remedies, have been found useful in the treatment of chronic diarrhœa:

Dilute sulphuric acid, 20 minims in water every four hours.

Aromatic sulphuric acid, 30 minims well diluted three times a day.

Alum in solution, 15 grains, or with sugar in wafers every six hours.

Iron alum, 5 grains, prescribed as a powder or pill three times a day.

Nitrate of silver, $\frac{1}{8}$ grain, in pill before each meal four times daily.

Arsenite of soda, $\frac{1}{20}$ grain, in solution every four or six hours (Trousseau).

Ammonia (carbonate or chloride), 5 grains every four hours.

Salicylic acid and salicin, 5 grains every six hours in emulsion.

Sulphate and oxide of zinc are useful in diarrhœa of phthisis in doses of 4 grains every six hours in pill.

Arsenic (2 minims of Fowler's solution) is very valuable in nervous diarrhœa, and more so in *lienteric* diarrhœa if given before meals, and in *malarial* diarrhœa.

Capsicum, 2 grains every four hours in *alcoholic* or *summer* diarrhœa.

Ol. menthæ pip., ol. caryophylli, ol. cajuputi, in 3 minim doses, may be given on sugar where there is much griping.

Charcoal has been given as an intestinal disinfectant, but naphthalin or salol is much better in 5 to 10 grain doses.

Ergot or ergotine, $\frac{1}{2}$ grain every six hours with morphine.

Ipecacuanha, 2 grains every six or eight hours in pill after food.

Hæmatoxylon: The extract of logwood in doses of 10 grains as a powder, or dissolved in water, is one of the very best remedies for the diarrhœa of phthisis or in tubercular peritonitis. It may be safely given to young children.

Tannic and gallic acids, 5 grains in solution every three or four hours.

Sulphurous, nitric, and nitro-hydrochloric acids are valuable when combined with quinine, bark, oak bark, or nux vomica in very chronic cases.

Podophyllin may be employed in hepatic conditions causing diarrhœa with pale stools, $\frac{1}{4}$ grain every night in pill.

Calomel may be given in the same way in 3 grain doses.

Rhubarb is a favorite remedy, and its purgative action is followed

by a decided astringent effect. Teaspoonful doses of the aromatic tincture twice a day is the most agreeable method of using the drug.

Pepsin and peptonized foods are most valuable in the chronic diarrhœa of children.

Coto bark, 5 grains, cotoin, ½ grain every four hours, are valuable in diarrhœas of phthisis and chronic intestinal catarrhs.

Enemata containing many of the above may be used with a little laudanum and starch.

Quinine in large doses (10 grains) affords the best method of treating vicarious diarrhœa where it is safe to interfere. In uræmic diarrhœa, diaphoretics and diuretics are indicated.

Digitalis and Caffeine are the best remedies where the diarrhœa is depending upon congestion of the portal system caused by cardiac embarrassment and failure.

Raw meat and Valentine's beet juice are very useful adjuncts. Niemeyer and Trousseau used the former in the chronic diarrhœa of teething infants with great benefit.

Arrowroot, or the old flour ball made by boiling common wheat flour in a bag for many hours until it becomes hard and then grating it, is recommended by A. V. Meigs in infantile diarrhœa.

DIPHTHERIA.

Diet is of the most vital importance, and there are few diseases in which feeding should be so closely looked after as in diphtheria, though Weber affirms that sudden collapse is not prevented by over-feeding. Cormack insisted upon the uselessness of feeding unless pepsin was added to the food. This is true only of the later stages of the affection, and must be kept in mind.

Strong stimulating food in large amounts, and in as short intervals as possible, should be the rule, so as to maintain the patient's strength. He should be kept in bed with light though warm clothing; his body heat must be anxiously watched, especially in the later stages of the disease, and signs of coldness of the extremities must be met with prompt applications of local warmth.

Stimulants should not be commenced too early, and in very mild cases may not be required at all, but generally stimulants will be found necessary, and if the physician can manage successfully to blend food and stimulant together it will be well; as food, stimulant, and medicine follow each other so closely, more time for feeding may be thus obtained. The best arrangement is to give brandy or whiskey with the milk, or good old port with beef tea, or sherry made into wine whey. Strong soups (oyster, turtle, or hare), beef jellies, good beef tea, or beef juice peptonized (see page 171), or paste made of pounded beef to which a few grains of pepsin are added, may be given at short intervals. If the disease progresses and emaciation occurs notwithstanding the consumption of a large amount of nourishment, and there

appears a fair amount of albumin in the urine, it will become evident that the patient cannot long stand the siege unless the digestion be improved. Everything in the way of food must be peptonized, and enemata of peptonized food must be given at shortest possible intervals.

If the larynx is involved in the disease, the steaming, heating, and ventilating of the room as detailed under croup must be carried out. In every case, ventillation and a generous supply of fresh, warm air must be kept up. Considering the highly infectious and serious nature of the disease, it will be the duty of the physician to direct measures for the prevention of the spread of the disorder to the other inmates of the house. The sick-room, placed if possible under a trained nurse, must be isolated, and all articles or persons leaving it must be regarded as possible conveyers of contagion. It is a good plan to have a large pail of water to which a liberal amount of Condy's fluid has been added; this should be placed outside the door of the room, and into it all spoons, knives, forks, plates, cups, etc., should be dropped as they leave the hands of the nurse. As a probable source of the original virus, house drains, the water and milk supply should be looked into, and the part that living poultry (chickens and turkeys) play in causing the disease in man should not be forgotten.

Medicinal treatment directed to the general state of the patient will be indicated. Chief amongst the best tried remedies is iron, which should be given in large doses; 20 to 30 minims of the tincture well diluted may be given every four hours. If there be much feverishness or a dry skin the following is a good routine receipt for an adult:

℞.—Tinct. ferri chlor. ℥j.
Liq. ammonii acet. ℥iij.
Glycerini ℥j.
Aquæ ad ℥x.—M.

S.—Take a tablespoonful in two tablespoonfuls of water every four hours.

Many substances have been recently strongly recommended upon the antiseptic or anti-microbic theory, with a view of destroying in the system the microörganism which is supposed to be the cause of the disease. Nearly every known antiseptic substance has been administered by the mouth, but with, upon the whole, not very satisfactory results. The following have been tried: Bichloride of mercury, or the red iodide of mercury, in doses of $\frac{1}{3\frac{1}{2}}$ grain, every three or four hours. (Jacobi gives $\frac{1}{2}$ grain of the bichloride in twenty-four hours to a child four years old for one week, diluted to 1 : 6000 or 1 : 10,000 in milk or water.) Calomel in 1 grain doses, or the cyanide $\frac{1}{4\,0}$ grain, are advocated. Many Continental physicians strongly recommend mercury internally in all cases of diphtheria, and the dosage seems to be increasing at a serious rate. The writer has made but limited trial of this heroic plan, and is not much impressed in its favor, though the

reports are more than roseate. He still believes that the best results internally are to be obtained from large doses of iron.

Boric acid is given in 15 grain doses, every four hours, and borax in similar doses. Either of these drugs may be mixed with the milk. Noel believes that they are eliminated by the mucous glands of the throat and mouth and act locally upon the disease.

Oil of turpentine, 3 capsules of 10 minims each, may be given every three or four hours, or the oil may be given in emulsion with ether.

Eucalyptus and creasote have been given in smaller doses. They are supposed to act in a similar way.

Peroxide of hydrogen has been given internally in drachm doses.

Salicin, salicylic acid, or the soda salt has been given alone, and in conjunction with the turpentine treatment, with what appears to be success, but it is most fallacious to judge of the effects of a drug in diphtheria by comparing the mortality after its use in one epidemic with the mortality of previous epidemics, the disease varies so widely in different outbreaks and in different localities.

Sulphur internally has been lately extolled, and it differs from most of the previously-mentioned remedies in being perfectly harmless. Knaggs, after many trials, found that it could be best administered in glycerin, which he "believes greatly enhances the efficacy of the sulphur." He gives 1 to 2 teaspoonful doses of a mixture of 3 drachms of pure precipitated sulphur, rubbed up with 2 drachms of chocolate powder in 6 ounces of glycerin, flavored with a little cinnamon. The writer finds that the best method of prescribing sulphur is to mix it with orange marmalade.

Benzoic acid, or benzoate of soda, in large doses, has many advocates. ½ drachm of the soda salt may be given.

Chlorate of potassium—10 grains in water every three hours.

Sulphocarbolates—10 grains in water four times a day.

Sulphurous acid—in doses of 30 to 60 minims, well diluted.

Guaiacum—30 to 60 minim doses of the ammoniated tincture in sherry.

Liquor potassæ—30 to 45 minim doses, well diluted.

Sodium hyposulphite and sulphites—in 20 grain doses in water.

Calcium sulphide—$\frac{1}{16}$ grain in pill every hour or two hours.

Solution of chlorine—15 minims, well diluted, every hour.

The local treatment of diphtheria is in a very unsatisfactory state. Some maintain that if the local lesion be very promptly dealt with, the disease will be much modified, or even speedily cured. Others, holding that it is a general disease, and liable to cause death, totally independent of the membrane thrown out in the air passage, condemn all local treatment. In our present state of knowledge, unfortunately, we are unable to arrive at a definite conclusion upon this very important point. But the researches of Pasteur upon the diphtheritic virus have convinced the writer that the local lesion must be taken into consideration. This observer after cultivating the microbe, filtered out the liquid secreted

by it, and, by the action of porcelain filters, separated the micro-organism completely from its own secretion. This latter was able to produce all the symptoms of diphtheria down to the paralytic phenomena. It would appear, then, that the microbe, living upon a mucous surface secreting a deadly poisonous substance, which is easily absorbed into the system, must become a serious local danger, and must be grappled with. This is, however, no justification for ignoring the grave constitutional state present in so many instances of the disease.

It would therefore appear at first sight that the main indication in the treatment of diphtheria would be to get at the false membranes a soon as possible and effect its destruction. This seems a simple matter only to those who have not studied the growth of the bacillus in suitable cultivations. It is proved, for example, that the Klebs-Loeffler bacillus, which produces the membrane, is to be found only in its growing, active condition in the middle or deeper layers of the mucous membrane, and not upon the surface where it can be reached by germ destroyers. This fact explains many of the difficulties and mysteries in connection with the failure of the various plans of local treatment in the disease. The physician who keeps painting the surface of the false membrane is simply bringing his remedies or agents into contact with bacilli, the vast majority of which have already become innocuous. As will be presently mentioned, some local plans of treatment have been recently introduced, which aim at overcoming this difficulty.

Of local methods of treatment there is practically no end, and each month adds to their number.

Caustics are being less and less used. Trousseau applied very strong caustic. Bretonneau also urged the destruction of the membrane by strong hydrochloric acid, frequently repeated. Jenner strongly recommended one good application of the strong acid to the membrane at the beginning. One part of the acid mixed with two parts (by bulk) of honey, makes an application of such consistence as to adhere to the part brushed over, and it is not so likely to run to surrounding healthy parts.

Strong solution of chloride of iron is used to destroy the false membrane. Carbolic, strong lactic, and other acids are, or have been, freely used to cauterize the local seat of the disease, with such very doubtful results that little can be said in favor of strong caustics as routine agents in the treatment of the disease.

After cauterization, or where cauterization is never resorted to, it is generally held that no attempt should be made to forcibly peel off or tear the membrane from the underlying mucous surface, though some insist upon this, and brushes have been devised for its forcible removal. Attempts have been made to cause the disintegration of the membrane by acting upon it with agents which have the power of digesting animal substances. Pepsin and papain, or the raw juice—

papayotin—from which the papain is derived, have been applied with what some authorities regard as brilliant successes. In the hands of others they have led to dismal failures. Finkler's papain, dusted as a powder over the surface of the membrane when reachable, is free from objection, and further trials may show its value, especially when we consider that anything which would break up, digest, or disintegrate the false membrane, would then permit of antiseptics being brought into contact with the mucous surface beneath it where the bacilli are growing actively.

Another class of remedies has been employed to cause solution of the membrane. Foremost among these come dilute solutions of lactic acid and lime-water, used as gargles or sprays. The lactic acid (dilute) 1 part to 8 of water, may be very freely and often used; 1 part to 8 or 10 of lime-water may be also tried, both as a gargle and spray, and locally applied with a large, soft camel's-hair brush. There is no doubt but these substances possess considerable power of dissolving the false membrane. The fumes of hydrofluoric acid, given off when flour-spar is acted upon by heated sulphuric acid in a leaden vessel, also possesses this power.

Seibert formerly rubbed in fine salt over the membrane twice daily, until it became "corned" or "cured."

Whatever difference of opinion may exist about the utility of these various methods of local treatment, there is an overwhelming mass of testimony in favor of repeated applications of mild antiseptic solutions. The writer has also satisfied himself of their great value, if not in cutting short the disease, certainly in minimizing the risk of septicæmia, and in controlling suppuration and putrefaction in the neighborhood of the membranous exudations.

Their value is certainly enhanced by any method which causes previous disintegration of the false membrane, and their action is liable to be rendered useless by strong corrosive agents, which so alter the physical character of the membrane as to prevent these antiseptics penetrating its layers to the mucous surface beneath.

One of the least objectionable and most innocent of these remedies, and one which may safely be intrusted into the hands of the nurse even when very young children and infants are to be dealt with, is boric acid. A saturated solution of the acid in glycerin may be freely applied with a soft brush every hour, or oftener, where there is much fetor. A solution of 3 drachms in 20 ounces of water may be used as a spray or gargle as often as possible without causing any worry and annoyance.

Corrosive sublimate, 2 grains in 1 ounce of water may be brushed over the membrane occasionally; or 1 grain in 8 ounces of rose water may be freely sprayed frequently. Loeffler, who has studied the action of the various germ destroyers upon artificial cultivations, finds this agent to be the most powerful of the series. Next to it he finds a

3 per cent. alcoholic solution of carbolic acid (*i. e.*, 3 drachms in 12 ounces).

Carbolic acid, 1 drachm in 10 ounces of rose water, is a safe, valuable, and elegant spray solution.

Chlorinated soda solution, diluted with twenty times its bulk of distilled water, or solution of chlorine, mixed with thirty times its volume of water, may be used with advantage where there is much fetor. Chlorinated lime may be used in the same way. Chlorate of potash, 5 grains to 1 ounce of water, with or without as much chloride of sodium, is a favorite gargle or spray solution.

Solution of chloride of lime, 1 part of the strong liquor to 4 of water and 2 of glycerin, may be frequently applied with a brush.

Permanganate of potash, 6 grains in 20 ounces of water, may be used as an injection where the nostrils are involved.

Chloral hydrate, 1 drachm dissolved in 1 ounce of glycerin, may be brushed on; or a solution, 10 grains to 1 ounce of water can be used as a spray or gargle.

Oil of peppermint, in its undiluted state, may be freely applied with a brush.

Salicylate of soda, sulphites, sulphocarbolates, sulphurous acid, tannin, quinine, chinolin, iodine, resorcin, iodoform, creolin, and nearly all the newer antiseptics, may be employed in much the same manner, either as a spray, gargle, injection, or in stronger solution for brushing over the membrane. The popular remedy, sulphur, should not be omitted. It is used as a gargle, ½ ounce to the pint, and the powder is used as an insufflation, or dusted on with a dry brush, alone, or mixed with quinine. Sulphur certainly *may* prove very efficacious; the sulphuretted hydrogen which is given off after its contact with the organic matter acts as a powerful germicide. Vlemingkx's solution has been used by some practitioners; it is more active than sulphur.

Various inhalations have been employed. They are of great value as adjuncts to the more direct treatment, and may be the only available means of reaching the disease locally in cross and nervous children, who repel all attempts at spraying or brushing out the throat.

Oils of turpentine and eucalyptus, terebene, tar, etc., may be made to saturate the atmosphere of the sick-room by mixing them with boiling water or steam. Iodine and bromine may be also used in this way.

Dr. Corbin has used mercurial fumigations with success. He makes a canopy over the child's cot with hoops, and volatilizes 40 to 60 grains of calomel, and keeps the patient in vapor for twenty minutes. This method is applicable where the larynx is the seat of the disease.

The most rational attempt to solve the great difficulties surrounding the local treatment of diphtheria has been recently made by Seibert,

of New York. Recognizing that all antiseptic or germ-destroying agents will be of little use unless the deep layers of the underlying mucous membrane containing the active bacilli can be acted upon, he has devised a means of applying germicides by local injections. This is accomplished by a disc attached to a syringe, and bearing a series of fine hollow needles, much as the bristles of a brush are attached to its back. By pressing the disc against a piece of false membrane, the needles are made to penetrate its depth and lodge in the underlying mucous membrane; by driving home the piston the antiseptic solution is lodged in the stratum, where active growth is proceeding. The solution which he employs is the chlorine water of the U. S. Pharmacopœia, which must be freshly prepared. About 1 gramme of this is injected. By this plan he believes that the agent is brought into direct contact with the bacilli and with the pyogenic cocci, which are also present. Striking results have been obtained, the local œdematous swelling and temperature rapidly subsiding. He uses a gargle and mouth-wash, a little of which is also to be swallowed; it consists of a little iodine and carbolic acid in water.

Where diphtheria extends to the larynx or trachea, or where it has started from or remains confined to these regions, its treatment may be carried out exactly on the same lines as laid down for the management of true croup. (See Croup.)

The question of tracheotomy is discussed under the head of Croup, on page 163.

Intubation of the larynx is especially valuable (according to the reports of those who have performed the operation) in the case of children under five years of age.

The insertion of the tube is not difficult. The child is made to sit bolt upright on the lap of a nurse with the head slightly backward. The mouth is opened widely, and a gag inserted. The operator introduces his left index-finger, and hooks the epiglottis forward, whilst with the right hand he inserts a suitably sized O'Dwyer's metal tube upon the point of an "introducer," passing it under the tip of the left index-finger into the larynx. The introducer being withdrawn, the tube is pushed home with the left index-finger. After a few moments coughing, the tube is generally easily tolerated.

Its extraction is more difficult, and special forceps are devised, made so as to enter the upper orifice of the tube, guided by the tip of the left index finger. Once inside the tube, the blades are opened and the tube removed.

Dr. Waxham has invented an artificial epiglottis of metal, which is attached to the upper end of the tube. It enables the patient to take liquid nourishment with ease.

The great advantage of intubation, which is still in its infancy, is that it will certainly be performed at a much earlier stage of the disease than tracheotomy. There cannot be a doubt that the high mortality after a cutting operation is largely owing to the objections of

the patient's friends, who refuse permission until too late. (See page 163.) Statistics show that, all round, the mortality from tracheotomy and intubation are very much alike, but there is a decided advantage upon the side of intubation when the *very* early ages are contrasted.

Macewen has successfully performed tracheal catheterism with a soft gum-elastic or rubber instrument, which differs from the short metal tubes of O'Dwyer. The end of Macewen's tube is left projecting from the mouth.

In the later stages of nearly all severe cases of diphtheria, constant irrigation of the nasal cavities and the back of the pharynx of the nasal douche or by a syringe is of vital importance. A warm stream of any weak, unirritating antiseptic solution may be employed every hour, in order to remove all pus or decomposing secretions.

Diphtheria of wounds is best treated by sprinkling calomel over them, or applying a strong caustic, as solid nitrate of silver, chloride of zinc, or pure lactic acid.

Diphtheritic paralysis is best treated by forced feeding or rectal alimentation, full doses of iron, quinine, and strychnine, and the continuous and interrupted current in conjunction with massage and constitutional remedies calculated to assist the general nutrition, as cod liver oil, change to the seaside, etc. For further details see under Paralysis (diphtheritic).

DISLOCATIONS.

The first indication for treatment in a case of dislocation is the obvious one of taking speedy measures for the restoration of the bone to its normal anatomical position.

If the displacement be seen immediately after its occurrence, in the great majority of cases it can be easily rectified by manipulation, as the great difficulty in reduction is not present to any extent. This is the reflex muscular contraction which offers such marked resistance to the efforts of the surgeon.

As is nearly always the case, some time has elapsed between the receipt of the injury and the visit of the surgeon, and then this reflex muscular contraction has developed.

Formerly *force* was the remedy always used for overcoming this, but the use of the general anæsthetics—chloroform and ether—has almost relegated the pulley, cord, and weights to the museums of surgical antiquities. Nevertheless force, when judiciously applied, will always continue to be a valuable aid in some cases. The aim of the surgeon should be to replace the bone by manipulation when possible; as a rule this is easy when the patient has been thoroughly chloroformed.

By movements of flexion, extension, adduction, abduction, or circumduction, the bone is replaced noiselessly in its capsule the exact nature and degree of movement being determined by various factors, such as

the formation of the joint, the extent of the rent in its capsule, the displacement of tendons, etc. Sometimes when complete narcosis has taken place the bone may be, as in shoulder dislocation, easily replaced in its socket by the direct pressure of the fingers upon its articular extremity.

When chloroform or ether is not available, or is contra-indicated, steady traction is to be made in the direction of the new axis of the limb until the resistance of the muscles is almost completely overcome. when the bone may be felt to slip into its place with a snap, being replaced by the action of its own muscles, as is witnessed in the reduction of dislocations of the humerus by placing the heel in the axilla, and making steady forcible traction upon the limb. Often, patient and gentle manipulation will achieve this without any appreciable degree of force being employed, and the writer, when resident surgeon in a large hospital for two years, nearly always reduced shoulder dislocations without chloroform in this way by raising the arm upward, the bone being manipulated into its socket at a moment when the muscles were taken unawares, or during a brief period of relaxation or exhaustion. Dislocations of the hip in nearly all recent cases can be reduced by manipulation under chloroform. The surgeon uses the femur as a lever to replace the head through the torn capsule by executing the movements of flexion, rotation, abduction, or adduction, according to the position of the displaced bone.

In old-standing dislocations considerable force must be used, but even then pulleys are seldom required.

Space does not permit of a detail of the various manipulations necessary for the reductions of the numerous dislocations occurring in the body.

After the bone has been replaced the limb must be kept in a state of absolute rest for a period varying from one to three weeks, until repair has set in in the lacerated capsule and injured soft structures.

DROPSY.

The treatment of this symptom or sign will be mentioned under the head of the different diseased conditions which are the causes of the accumulation of serous fluid. Thus the treatment of general dropsy is referred to under Bright's disease and heart affections, and dropsy of the peritoneum under ascites.

DROWNING.

After the patient has been rescued from the water he should be turned upon his face for a second or two to permit the escape of any fluid. At the same time firm pressure should be made over the abdomen and thoracic margin. The following rules are recommended by the Royal Humane Society; they were drawn out originally by Sylvester:

"Rule 1. *To maintain a free entrance of air into the windpipe.*—Cleanse the mouth and nostrils; open the mouth; draw forward the patient's tongue, and keep it forward; an elastic band over the tongue and under the chin will answer this purpose. Remove all tight clothing from about the neck and chest. See that nothing is lodged in the larynx, pharynx, or œsophagus.

"Rule 2. *To adjust the patient's position.*—Place the patient on his back on a flat surface inclined a little from the feet upwards; raise and support the head and shoulders on a small, firm cushion or folded article of dress placed under the shoulder-blades. If natural respiration has ceased, instantly proceed to carry out

"Rule 3. *To imitate the movements of breathing.*—Grasp the patient's arm just above the elbows and draw the arms gently and steadily upward until they meet above the head (this is for the purpose of drawing air into the lungs); keep the arms in that position for two seconds; then turn down the patient's arms and press gently and firmly for two seconds against the sides of the chest (this is with the object of pressing air out of the lungs. Pressure on the breast bone will aid this).

"Repeat these measures alternately, deliberately, and perseveringly, fifteen times in a minute until a spontaneous effort to respire is perceived, immediately upon which cease to imitate the movements of breathing, and proceed to *induce circulation and warmth* (Rule 5).

"Should a warm bath be procurable the body may be placed in it up to the neck, continuing to imitate the movements of breathing. Raise the body in twenty seconds into a sitting position, and dash cold water against the chest and face and pass ammonia under the nose. The patient should not be kept in the warm bath longer than five or six minutes.

"Rule 4. *To excite inspiration.*—During the employment of the above method excite the nostrils with snuff or smelling-salts or tickle the throat with a feather. Rub the chest and face briskly and dash cold and hot water alternately on them. After natural breathing has been restored proceed to carry out

"Rule 5. *To induce circulation and warmth.*—Wrap the patient in dry blankets and commence rubbing the limbs upwards, firmly, and energetically. Friction must be continued under blankets or over dry clothing.

"Promote the warmth of the body by the application of hot flannels, bottles or bladders of hot water, hot bricks, etc., to the pit of the stomach, armpits, between the thighs, and to the soles of the feet. Warm clothing may generally be obtained from the bystanders. A teaspoonful of warm water, wine, warm brandy and water or coffee may be given as soon as the power of swallowing has returned. The patient should be kept in bed and sleep encouraged.

"During reaction large mustard plasters to the chest and below the shoulders will relieve the distressed breathing."

The above method of performing artificial respiration is known as Sylvester's. If the stomach should be full of water, pressure made upon it may force the water up the gullet during the expiratory manœuvre, and this water may be sucked into the trachea and bronchi during the artificial inspiratory act.

Marshall Hall's ready method is sometimes useful in the absence of all assistance. It is carried out by placing the body first on the left side and rolling it over with the face downwards, so as to drive the air out of the lungs, and then rolling it back again until the face looks upwards and the dorsum is in contact with the ground, when the elastic recoil of the ribs will draw the air into the lungs. These alternating rolling movements should be performed about twelve times in the minute.

Howard's treatment consists in first turning the patient upon his face, with his forehead resting upon his wrist or forearm to keep the mouth from the ground. A firm roll of clothing is placed under the stomach, so as to cause the head to be considerably lower than the trunk. By pressing forcibly and firmly upon the spine, water is thus forced out of both stomach and lungs. The body is then rapidly turned over, face uppermost, with the roll of clothing beneath the thorax, and the head and neck bent well backward, and the arms held above the head by an assistant, who should also keep the tongue well forward. The operator, kneeling astride the patient's hips, places the palms of his hands upon the thorax over the short ribs, with the tip of each thumb upon the xiphoid cartilage. Then, by alternating throwing the weight of his body forward for two or three seconds, and suddenly easing off with a push and resting for three seconds, the air is made to leave and to enter the thoracic cavity at about the rate of ten times in a minute.

While the artificial respiration is being performed, other assistants may be carrying out friction, massage, and application of heat, etc., as before mentioned.

The induced current may be used by applying one pole over the phrenic nerve in the neck and the other over the sixth interspace between the right axillary and mamillary lines, so as to produce vigorous contraction of the diaphragm. The poles should be applied at the moment when the artificial inspiratory manœuvre is being performed.

The efforts at restoration should be continued for at least half an hour, and if there be the slightest sign of returning life at the expiration of this time, the operator should not cease for one hour longer at least. Hypodermic injections of ammonia and ether may be given after breathing is established.

Two minutes' submersion is held to be fatal. The writer has timed, at a private *séance*, a professional swimmer who remained under water in a large glass tank four minutes five and a half seconds, his features being under observation all the time. The performer was slightly exhausted, but in a minute afterward appeared perfectly well.

DUPUYTREN'S CONTRACTION OF THE PALMAR FASCIA

can only be successfully treated by a free division of the contracted and thickened bands of palmar fascia with their prolongations. In mild cases at the beginning, forced extension and bandaging upon a splint applied to the palm of the hand at night, with passive motion assiduously kept up during the day, may effect a cure. The writer has seen one case, where the little finger was affected, yield to this treatment, but as a rule the contraction steadily progresses.

The free subcutaneous division of all the bands by a stout tenotomy knife, and the application of an inflexible splint extending from the middle of the forearm beyond the tips of the fingers, is the best method of dealing with this troublesome affection. If the contraction returns after this treatment there is nothing left but to dissect a flap of skin from the palm of the hand and divide each band of thickened fascia, continuing the dissection until the fibrous prolongations extending into the web of the fingers are completely excised. Kocher insists upon a thorough *extirpation* of the thickened and shortened palmar fascia with its extensions, after simple longitudinal incision of the skin of the palm; he holds that no operation can guarantee against relapse unless it include prophylactic excision of healthy parts of the fascia.

There is still considerable difference of opinion among surgeons regarding the relative values of the subcutaneous and open operations. These are ably contrasted in a paper in the *British Medical Journal*, by Macready, in February, 1890. Adams operates by the subcutaneous method. This plan, though it does not admit of the excision of the fascia, or the remedying of the gouty deformity of the joints, or of the division of the bands when they have become calcareous, nevertheless admits of repetition in cases of relapse, which is a great advantage over the open operation, as in many cases where this fails the relapse is incurable.

DYSENTERY.

The treatment of the acute variety of this affection may be summed up in the word—ipecacuanha (*radix anti-dysenterica*). It is most efficacious when given in the early stage, and the best results have followed the administration of large doses, though often-repeated small doses have led to excellent results. From 25 to 50 grains of the powdered root should be given in a bolus, or in large pills (5 to 10 grains each), or rubbed up with 3 drachms of syrup and 3 drachms of water, or folded up in wafer paper. After its administration the patient should be kept in bed, upon his back, and a sinapism over the stomach diminishes the risk of vomiting. Liquids and all food should be avoided for a few hours, small pieces of ice only peing permitted.

Vomiting does not often follow, and should it occur, the remedy may be repeated in a few hours again. Two such doses during the twenty-four hours in a few days dispel all tenesmus and diarrhœa.

A preliminary dose of opium or a small hypodermic of morphine may be tried where nausea already exists, but such precautions are seldom necessary, as there is generally a very marked tolerance of the drug in dysentery. When the symptoms of the disease subside, and the motions become distinctly feculent, the dose may be considerably diminished.

Some practitioners give 5 to 10 grains every four or six hours, combined with bicarbonate of soda and carbonate of bismuth, with a little opium.

Astringents and full doses of opium are not only useless, but do much harm in the acute stage of the disease.

When malaria is present, full doses of quinine must be given, and it is a good plan to administer the ipecac in the morning and at night, and one large dose (20 grains) of quinine in the middle of the day.

The diet must be carefully regulated, and only liquid food permitted. Strong soups and milk, with arrowroot and mild stimulants, can be administered with safety, and the general management already mentioned under Diarrhœa is indicated. The hot bath is of great use in relieving pain and tenesmus.

Children may be similarly treated, and a child two years old may get 4 grains of the powdered root night and morning.

In the *chronic* disease ipecacuanha may be tried, but often fails. The first thing in such a case is to effect the removal of the patient from his old surroundings, to change his food, improve his blood, if there be any purpura present, by the use of pure fresh lemon juice, and keep him at rest in a warm, well-ventilated room.

Ten grains of the powdered ipecacuanha may be given every eight hours, and if speedy improvement does not appear to supervene astringents must be tried. The best of these is 1 grain of nitrate of silver, combined with three grains of ipecacuanha, and ½ grain of morphine every six or eight hours.

Ten grains of gallic acid may be given every four hours, or 3 grains of acetate of lead, combined with 1 grain of powdered opium; sulphate of copper, sulphate of zinc, and sulphate of iron may be tried. A favorite remedy is the liquor ferri nitratis in 30-minim doses, largely diluted, every six hours, or 10 minims every hour.

Castor oil has been used at different stages of the disease with some benefit, and calomel was formerly given, but is seldom indicated. Any of the vegetable astringents may be tried. Enemata of starch and opium often give great relief to the tenesmus. Where the mischief appears to be confined to the lower part of the great intestine, much benefit in very chronic cases may be obtained from rectal injections of nitrate of silver. Eight grains dissolved in 20 ounces of warm distilled water may be used to wash out the rectum, or a small enema, 3 grains in 2 ounces of water, may be thrown up with the view of being retained.

Alum (1 : 25) and creolin (1 : 200) have been used as injections with some benefit. Indian authorities are divided upon the utility of the Bael fruit in dysentery. In the acute affection good results have been recently reported from ½ minim doses of tincture of aconite half hourly for eight hours, and afterward hourly till pain and tenesmus subside. Naphthalin, corrosive sublimate, cannabis indica, turpentine, eucalyptus, creasote, iodine, and nearly every antiseptic, have been recommended and used with varying success.

DYSIDROSIS.

Any soothing ointment in the early stage will relieve itching; the best application will be 1 drachm of the liquor carbonis detergens, with 1 ounce of cold cream or vaseline. When the vesicles appear the patient should be at once put upon full doses of arsenic and a liberal diet; 5 minims of Fowler's solution need not be exceeded. Considering that the hands, and sometimes, though rarely, the feet, are the only parts of the body attacked, the local treatment is easily carried out. Tilbury Fox recommended diuretics, but the writer has never seen any necessity for acting upon the kidneys with the view of relieving the tension in the minute vesicles. Iron, combined with the arsenic at a later stage, appears to prevent new crops making their appearance.

DYSMENORRHŒA.

Dysmenorrhœa must be regarded as a symptom common to several conditions, local and constitutional, and its successful treatment can only be arrived at after a careful diagnosis of the cause of the pain. The difficulty is not lessened by the various attempts at classification, some authorities describing many distinct varieties of dysmenorrhœa whose existence is denied by others.

Much difference of opinion exists about the possibility of dysmenorrhœa being caused by mechanical obstruction, and without entering into this vexed question one may say that there cannot be a doubt but large numbers of cases of painful menstruation have been permanently cured by dilatation of the external or internal os. It is just possible that the dilatation strikes deeper than merely causing a widening of the cervical canal; it may relieve a congested or inflamed condition of the lining membrane which may be the cause of the dysmenorrhœa. The writer has been often struck with the speedy and permanent cure of gleet and chronic urethral discharges after dilating the urethra to its fullest size.

Where the symptoms of obstructed flow are present, and the patient suffers intense pain of a paroxysmal character which compels her to take to bed at each menstrual period, a careful examination may reveal obstruction at the os internum or os externum, or the narrowing may be caused by a sharp or acute flexion of the uterus, especially retro-

flexion. Should this latter condition be found present, it should be at once remedied by a suitable pessary.

Where there is distinct evidence of a marked narrowing of the cervical canal or internal os, there is a fair ground for expecting relief by dilatation. The operation may be performed in various ways:

1. *Gradual* dilatation of the canal and internal os, by means of vulcanite or solid metal tapering bougies introduced at intervals of several days.

2. *Sudden* dilatation, by introducing one size of bougie after another at the same sitting, until the canal is restored to its normal extent.

3. *Rapid, forcible* dilatation, by a forceps-shaped instrument introduced through the internal os and the blades separated.

4. By the introduction of sponge, laminaria, or tupelo tents.

All these methods are unsatisfactory, and soon permit of the dilated part returning to its previously narrow state; and there is, moreover, serious danger in using tents, especially sponge tents. The strictest antiseptic precautions are always necessary.

Madden's method, which differs somewhat from former operations, is the most satisfactory. He operates at about one week after menstruation. After repeated vaginal douching with hot water, the patient is placed (under chloroform or ether) in the usual left lateral semi-prone position, and Simpson's original metrotome passed into the uterus, and two free incisions made the entire length of the uterine canal. Having washed the uterine cavity free of all clots by a stream of very hot water, he introduces a very simple dilator designed for the purpose, and, before it is withdrawn, by pressing upon the handle the canal is dilated to any desired extent. The amount of dilatation can be easily seen by an index, and sufficient force is used, by withdrawing the instrument with the blades apart, so as to tear asunder and distend the cut surfaces to such an extent that the index-finger can be passed into the uterine cavity. The uterus is again washed out with hot water, and a tampon of cotton wool, saturated with glycerin of carbolic acid (1 : 4), left *in situ* for some days. After ten days a flexible tube or uterine stem pessary is worn for about a month. Some authorities strongly condemn this form of pessary.

Marion Sims divided the external os with scissors, and the internal os with a long blunt-pointed knife.

Recent experience proves that Apostoli's method of using the strong continuous current has a powerful influence over obstinate dysmenorrhœa, associated with a narrow pin-hole os and conical cervix.

Neuralgic or spasmodic dysmenorrhœa calls for rest in bed, when this is possible, during the attack, and a hot hip-bath, or the immersion of the feet and legs in hot water and mustard. Anodynes must be given with great caution, chiefly on account of the danger of establishing the morphine habit. Alcohol, for similar considerations, must be seldom permitted.

Where the agonizing pain is unusually severe, chloroform or ether may be administered sparingly. A hypodermic injection of ¼ grain of morphine, with 1 minim of solution of atropine (1 : 100), may be given; ¼ to ½ grain of morphine may be given in the form of a pessary or suppository; or 1 to 2 grains of watery extract of opium in suppository; or 30 minims of laudanum as an enema, with a little starch water.

Chloral, in 15 to 20 grain doses, relieves spasm and induces sleep.

Than cannabis indica there is no safer anodyne, and small pills, containing $\frac{1}{12}$ of a grain of the extract, may be given every hour for six hours. The writer prefers this drug to opiates in dysmenorrhœa.

Belladonna, 3 to 5 minims of the succus, every hour for six hours.

Butyl-chloral 2 grains in pill every hour for six hours.

Nitrite of amyl, by inhalation, or ¼ minim every hour for six hours.

Nitro-glycerin. A tablet ($\frac{1}{100}$ grain) may be divided into eight fragments, of which one may be taken every ten minutes till relief is obtained.

Cajuput oil may be given in doses of 1 drop on sugar every hour or two, until 12 minims be taken.

Sumbul, in doses of 15 minims of the tincture, every two hours.

Castoreum has been highly praised by Champneys, who states, in his *Harveian Lectures*, that he has known cases treated by nearly, if not quite, all the usual drugs unsuccessfully, which got well suddenly as soon as this drug was given. It is best given in the form of tincture, 20 or 30 drops three or four times daily during the pain, with or without a few drops of tincture of nux vomica.

Guaiacum, alone or with sulphur, is also much used by Champneys.

Camphor, 2 grains in pill or 5 minims of the spirit every two hours, may be tried.

Apiol, in capsules containing 3 minims each, may be given every two hours for six or eight times. It is very useful where severe pains precede, for a time, the appearance of the flow.

Electricity, in the form of the continuous current, is valuable in this variety of the affection, especially if the flow is habitually scanty. Twenty Lelanché cells may be used, with one pole placed over the uterus or ovarian region, and the other applied to the sacral region. Intra-uterine application is much more effectual, if there be no objection to its use.

Antipyrine, in 10 grain doses every four or six hours, sometimes gives great relief, and is free from the objections to which narcotics are liable.

Gelsemium, in 5 minim doses of the tincture every two hours.

Hamamelis, in the form of hazeline, may be given in doses of 20 to 30 minims every hour for ten or twelve hours.

Ergot, by stopping the irregular contraction, sometimes gives relief in moderate doses.

Bromide of sodium, potassium, or ammonium, in doses of 30 grains every four or six hours, relieves spasm and diminishes pain.

Valerianate of zinc, asafœtida, musk, guaiacum, and saline purgatives have been successfully used in many cases.

The passage of a graduated bougie, though no evidence may be present of any marked obstruction, has often led to most satisfactory results in spasmodic or neuralgic dysmenorrhœa.

Champneys points out that the os internum is the sensitive point for the uterus. By stretching this, years of dysmenorrhœal agony are concentrated into a few minutes; the irritability of the uterus is exhausted; it rests, and has a chance of starting afresh—a chance it may or may not accept. He looks upon dilatation as the last resort. It should be done under an anæsthetic.

Caulophyllin (1 grain every two hours), viburnum opulus, viburnum prunifolium (1 drachm of liquid extract), anemone pulsatilla (2 minim doses of the tincture every two hours), are remedies of some use in amenorrhœa, and have often given good results in dysmenorrhœa.

Hydrastis has lately been favorably reported upon.

Conium, by the mouth, or in the form of a suppository, is also being tried with apparent advantage.

The treatment of this variety of dysmenorrhœa, in the intervals between the attacks, is of the utmost importance. Everything that improves the general health must be insisted upon, chiefly open-air exercise to the fullest extent, and active amusements or domestic work within doors, plain nutritious food, good hours, and warm clothing, especially about the lower extremities.

There are few details of greater importance than this latter. Thick-soled boots and woolen stockings are essential adjuncts in the treatment of this variety, as they are in the management of the inflammatory or congestive form of dysmenorrhœa.

Anæmia must be combated with large doses of iron, and any evidence of neuralgia of the superficial nerves should be treated by a prolonged course of arsenic and quinine.

Tonics, like strychnine, nux vomica, mineral acids and vegetable bitters, Easton's syrup, or valerianate of zinc, may be freely given.

Rheumatic or gouty tendencies are credited with causing this affection, and though this is doubtful, nevertheless colchicum, guaiacum, iodide of potassium, salicylates, and alkaline carbonates may be ordered.

Constipation should be met with cascara sagrada, combined with glycerin and nux vomica, and errors in digestion met with bismuth, pepsin, creasote, etc.

Champneys concludes his *Harveian Lectures* (1890) with an able discussion of the *ethics* of the treatment of dysmenorrhœa, which should be read by all who wish to get a clear idea of the difficulties surround-

ing this delicate question. There is no doubt about the necessity for postponing the first vaginal examination in young virgins as long as possible, and when the symptoms warrant a local examination, the authority just mentioned advises that it should be made by the rectum, at least in the first instance.

The *congestive* or *inflammatory* form of dysmenorrhœa, if brought on by a sudden chill during the beginning of a menstrual period, must be met by promptly immersing the patient in a very hot bath, hot sitz-bath, hot pack, or hot mustard and water foot-bath. After coming out of the bath a large mustard and linseed poultice should be placed over the loins.

Hot vaginal douches are valuable at this stage, and small doses of aconite every half hour, combined with a diaphoretic or with cimicifuga, may be tried. The following is a good combination:

℞.—Tinct. aconiti ♏vj.
Liq. ammon. acet. ℥jss.
Tinct. cimicifugæ ʒijss.
Aquæ chloroformi ad ℥viij.—M.

S.—Take a tablespoonful every hour.

Urgent pain must be relieved by opium, morphine, chloral, cannabis, or any of the remedies previously mentioned upon page 211. Leeches applied to the os have given speedy relief, and a few full doses of ergot are often valuable by correcting the irregular contraction. In congestive dysmenorrhœa, coming on regularly every month, without any causes being present suggestive of a chill or suppression of the menstrual flow, plethora will be found to play an important part. In such cases free purgation with saline cathartics is the best treatment.

℞.—Magnesii sulphatis ℥jss.
Acidi sulphurici dil. ʒj.
Antimonii et potassii tart. gr. j.
Aquæ menthæ pip. ad ℥x.—M.

S.—Take a tablespoonful every three hours, until liquid stools are produced.

A full dose of blue pill or any other mercurial before the saline is beneficial. It is in these cases that the saline springs are valuable—Carlsbad, Pullna, Vichy, etc., but there is no remedy equal to the plain Epsom salt. Active exercise and a well-regulated diet is of the greatest importance in the intervals between the attacks.

The treatment of *membranous* dysmenorrhœa has been hitherto very unsatisfactory, but the recent applications of Apostoli's method of using strong continuous currents have given sometimes excellent results.

Playfair has had great success in the treatment of membranous dysmenorrhœa by using the negative intra-uterine current up to 50 milliampères, and this bids fair to be the only method worth trying in this most obstinate form of painful menstruation.

This is also the best treatment for the chronic endometritis, which is often the cause of the complaint. The galvanic current is used at intervals during the attacks, and the large clay abdominal electrode is connected with the positive pole of the battery, while the negative electrode, properly guarded, is introduced inside the uterus, and a current allowed to flow for about ten minutes. The strength may vary from 25 to 200 milliampères, but rarely will it be necessary to exceed 50 to 70. Twice a week during the intervals between the passing of the membranous casts will be enough for all ordinary cases.

Improvement of a moderate kind has followed the use of the continuous current when applied externally with one pole over the uterine region, and the other over the sacrum. Nevertheless, in those cases where the physician does not wish to suggest or carry out intra-uterine treatment, the external application of a strong continuous current, say from 30 Leclanché elements, may be followed by such benefit as will render Apostoli's method unnecessary.

Champneys advises the scraping out of the uterus *repeatedly* with an irrigating curette flushed with antiseptic solution, preceded by dilatation.

The violent pain during the attack must be met by anodynes and hypodermic injections of morphine, a very mild inhalation of chloroform, or sometimes the nitrite of amyl may be enough. Castoreum, antipyrine, cannabis indica, chloral, and the other remedies may be tried with advantage when the peculiarity of the patient forbids the ordinary narcotics being administered.

The danger of the opium, chloral, or alcohol habit becoming established, must be ever before the physician, especially as the diseased condition is a very chronic one.

The general treatment during the attack will, in the main, correspond with that of spasmodic dysmenorrhœa. (Page 205.)

The bowels must be carefully attended to, and between the intervals everything that will improve the general condition should be insisted upon. Tonics are indicated, and of these there is no drug equal to arsenic in moderately large doses, say 4 or 5 minims of Fowler's solution thrice daily after food. Belladonna often does good when administered for three or four days previous to the attack; it should be given in doses of 10 to 15 minims of the tincture four times a day.

Removal of the appendages has been recommended, and in one case is said to have been successful.

The treatment of so-called *ovarian* dysmenorrhœa resolves itself into the management of the abnormal condition of the ovary. The most important remedy is the constant current applied by means of one pole over the ovarian region, and the other over the sacrum. The induced current should be tried every third or fifth week in a similar way.

Bromide of sodium should be given in full doses, 15 grains, three times a day during the interval, and as the expected menstrual period arrives this dose should be doubled to blunt the sensibility. The iodide

of sodium has succeeded after the failure of the bromide; they may be combined advantageously.

A smart purge is of great value, and if there be a prolapsed ovary the rectum should be kept empty by copious enemata of warm water. After the establishment of the flow the bromide and iodide treatment may be stopped for fourteen days, during which small doses of arsenic and iron may be given with advantage, and moderate doses of quinine may be substituted occasionally. During the attacks Indian hemp and opium, chloral, or even chloroform may, in some cases, be required.

Counter-irritation and hot stupes with warm water injections, hot baths, and local hot packs afford relief. Where there is evidence of ovarian congestion leeching relieves the symptoms promptly. Any remedy which obviates the constant use of narcotics should be persisted in, and 10 grain doses of antipyrine, or 5 grains of antifebrin are often invaluable, and may be safely used for long periods.

DYSPEPSIA.

Acute attacks of dyspepsia generally depend upon some error in diet, and, as a rule, rapidly subside when the cause is removed. Total abstinence from food for eighteen hours will often be found to entirely remove all symptoms. Painful attacks of acute dyspepsia generally are cut short when vomiting occurs, and this occurs to the physician the wisdom of giving an emetic and clearing out the contents of the stomach. If there be ineffectual attempts at vomiting already established by the patient there should be no delay in giving 30 grains of powdered ipecacuanha, or 30 grains of sulphate of zinc, or a tablespoonful of mustard in a large tumblerful of water, followed by copious draughts of warm water till the stomach is thoroughly washed out. Though there be no efforts or inclination to vomit when the patient is first seen, if there be very severe pain, it will be good practice to give an emetic. Warm infusion of chamomile, in teacupful doses, is a splendid emetic in these cases. Should a considerable period have elapsed between the taking of a heavy meal and the patient being visited by the physician, and there be evidence of undigested food in the intestines, a smart purge will give speedy relief.

This may also be tried in those cases where vomiting has not already given relief. One ounce of Rochelle salt, dissolved in a tumblerful of aërated water, or 2 ounces of the mistura sennæ comp. answer well. Epsom salt, or any purgative, however, may be given with advantage.

There should in all cases be abstinence from solid food. Small quantities of milk and kali water, or of arrowroot, should be taken at short intervals, and when nausea is distressing ice may be given, and teaspoonfuls of Brand's essence or Valentine's meat juice. Should vomiting persist, morphine may be given, and by far the best form for the administration of the drug in such cases is a pilule or perule containing not more than $\frac{1}{16}$ grain, and made up into the smallest possible bulk

and finished in globular form with a thin gelatin coating. Such are made by most pill manufacturers, and are a valuable addition to elegant pharmacy; they can hardly be rejected, even if the vomiting be continuous. An effervescing mixture containing hydrocyanic acid (2 minim doses) may be given.

Bismuth, in the form of subcarbonate or oxide, in doses of 5 to 10 grains, is a favorite remedy. The writer has seen little benefit from it in the vomiting of acute dyspepsia. One large sinapism over the stomach may stop the nausea and vomiting at once. The quantity of liquids permitted should be very limited, and stimulants are often injurious. Teaspoonful doses of good old whiskey, mixed with 1 ounce of soda water, will be the least objectionable.

The return to ordinary diet should be postponed for some days, during which the patient may live upon light farinaceous food, or milk puddings, with beef tea or chicken soup, rennet, etc.

Where the recovery from the acute attack is slow or incomplete, or where the first attack is followed by a series of subsequent attacks, the treatment detailed under chronic dyspepsia will be indicated.

Chronic dyspepsia is one of the most obstinate affections which the physician has to deal with, and his chief object before commencing treatment should be to determine, if possible, the *cause*. There can be little good results obtained by feeding the patient upon drugs or chemicals while the cause of his ailment may be mental worry, gluttony, alcoholism, sedentary occupation, or other violation of some important law of health.

The diet should be most carefully attended to, and advice given, after minute cross-examination, upon this point. It will often be found that the patient has been injuring his stomach by habitual and unvarying adherence to some restricted form of diet, while he has, owing to some pre-conceived error in judgment, been abstaining from articles of food necessary to life. He may be, however, only paying the penalty due to constant gormandizing or general excess in eating and drinking.

Speaking generally, one may say that it is a mistake for the physician to have a stereotyped dietary cut and dry for every form of stomach ailment, though this is a popular and "taking" method of treating stomach complaints.

Few cases of irritative dyspepsia come before the physician in which he will fail, after proper painstaking, to discover one or more serious errors constantly made in diet. The correction of these errors may alone afford the best or only method of treating the disorder satisfactorily.

It is not unusual to find dyspeptics living upon a diet so restricted as to seriously interfere with the general nutrition, because they attribute the discomfort following eating, to one food after another, until but a few remain upon which they strive to live. After a time, irritative dyspepsia gives way to a hopeless atonic condition. Thus, vegetables are at first found to cause such distress that their use is gradually given

up, and when the patient comes under observation he may be suffering from a condition bordering upon scurvy.

It will be found difficult or impossible to lay down a hard and fixed law about certain articles of food in dyspepsia, but there are certain dishes about which one can speak as being generally liable to serious objections. Thus, pork, pastries, veal, broiled or stewed meat, re-cooked meat, rabbit, salted or corned beef, sweetmeats, cheese, eggs, crabs, lobsters, nuts, pickles, crude vegetables, especially young potatoes, carrots, parsnips, turnips, cucumbers, and fresh bread, should be forbidden, or only taken in very small quantities.

Beefsteak properly cooked upon a gridiron, with all charred portions carefully rejected, is the most digestible animal food that the dyspeptic can eat. Roast beef and mutton, game, poultry, and boiled white fish can be taken with impunity in most cases. Vegetables belonging to the cruciferæ generally are doubtful or hurtful, though the heart of cauliflowers may be used. Vegetable marrow, stewed lettuce, and celery are innocent. Farinaceous foods are, generally speaking, admissible, though sometimes they aggravate the mischief.

It is, however, always to be remembered that strong dislikes or marked prejudice against any food may cause it to disagree. The writer has verified, in his experience, the statement of Flint: "It is never advisable for the patient to adopt a restricted range, or any particular system of diet. On the contrary, it is important to persevere in attempting to digest all the varied forms of wholesome food, not being restricted to a meat or a vegetable diet, but aiming to eat like persons in health without the need of particular care in the selection. I have never known a dyspeptic to recover vigorous health who undertook to live after a strictly regulated diet, and I have never known of an instance of a healthy person living according to a strict dietetic system, who did not become a dyspeptic. On the other hand, in a great number of cases in which persons have been sufferers for years on a regulated diet, health has been speedily regained by simply eating in accordance with appetite." The writer has seen serious and nearly fatal consesequences follow rigid adherence to the raw beefsteak and hot water treatment of dyspepsia.

The following are very common errors which lead to dyspepsia, and their correction is of great importance in the treatment of the affection: Improper mastication of food, generally caused by haste in eating or by want of teeth; too long or too short an interval between the meals (four hours is a good average); drinking of large quantities of fluid at meal times, especially cold water or cold milk; the habit of taking stimulants, especially wines, and strong tea or coffee in excess between meals. Severe mental work or too active exercise immediately after a full meat is very injurious. Breakfast should not be taken immediately after getting out of bed.

Hygienic measures, which improve the tone and vigor of the general system, are indicated—as suitable clothing; healthy residence upon an

elevated, dry situation; open-air exercise; sea-bathing; change of scene, and, if convenient, of employment; with early hours, and freedom from occupations causing high pressure or mental worry. Agreeable society, especially at meal times, is of much use, and it is a good rule which prevents the dyspeptic from dining alone. The habit of reading, while the patient sits at meals, is very objectionable.

The medicinal treatment of dyspepsia is only to be undertaken after a thorough revision of the dietary as before-mentioned. If constipation be present, it should be treated by cascara. (See under Constipation, page 144.) Purgatives should not be habitually used, but the occasional use of a mineral water—like Friedrichshall or Harrogate—is beneficial.

Anæmia, when present, must be treated with iron; though, in irritative dyspepsia, this drug must be used with great caution. In the atonic form it often gives unexpected benefits.

For the stomach symptoms in *irritative* dyspepsia, accompanied with chronic gastric catarrh, sedatives are indicated, and for routine treatment, especially when pain is present, the subcarbonate of bismuth, in powder, in doses of 10 or 15 grains, is the most innocent gastric sedative. It may be given in a mixture suspended with mucilage. Hydrocyanic acid may be combined with it. Morphine is of great service, but only in doses of very small amount; the local, not the constitutional, effects are required, and this object is gained by doses of $\frac{1}{24}$ to $\frac{1}{16}$ grain.

Magnesia is a valuable gastric sedative, and may be advantageously combined with the bismuth thus:

℞.—Bismuthi sub-carb. ℥iij.
Magnesii carb. ℥iij.
Morphinæ hydroch. gr. j.—M.
Divide in 18 equal powders.

S.—Take one four times a day, one hour after meals.

Or,

℞.—Bismuthi subcarb. ℥v.
Acid. hydrocyanici dil. ℥j.
Morphinæ hydroch. gr. jss.
Mucilaginis acaciæ recentis ℥jss.
Aquæ camphoræ q. s. ad ℥iv.—M.

S.—One teaspoonful four times a day before food, the bottle having first been shaken.

Schacht's liquor bismuthi, in drachm doses, is a valuable gastric sedative where pain, nausea, or acidity is present. It is undesirable to prescribe large doses of alkalies to be taken habitually for long periods, though a full dose of bicarbonate of soda often gives speedy relief to the pain of irritative dyspepsia where bismuth and other remedies fail. Carbonate of ammonia, or drachm doses of the aro-

matic spirit in a wineglassful of kali water, will be a good substitute for the soda salt.

Antipyrine, in doses of 5 grains in tablet form, gives temporary relief, and capsules of creasote are invaluable in some cases. In very chronic cases full doses of nitrate of silver (½ grain) given before meals have a good alterative action upon the irritable membrane. It should be given in pilular form, and only for brief periods. Two grain doses of the oxide of silver act in a similar way. Oxalate of cerium may be tried as a sedative during the intervals of the silver treatment.

Where much mucus is vomited, astringents like alum (5 grains), kino (10 grains), tannin (10 grains), with opium, may be given. Counter-irritation by means of sinapisms, leeches, dry cupping, small blisters or a band of lint soaked in diluted nitro-hydrochloric acid (one part of the dilute acid in ten of water) worn around the abdomen under oiled silk or thin mackintosh, often materially relieves catarrhal stomach troubles.

If the dyspepsia be caused by a chronic congestion of the gastric membrane caused by valvular lesion, the vessels should be promptly relieved by smart saline purges of magnes. sulph. in strong solution (8 drachms in 4 or 6 ounces of water) to ensure emptying of the vessels. Afterward dyspeptic symptoms disappear when the cardiac muscles is strengthened by a judicious course of digitalis and nux vomica in small oft-repeated doses.

When the gastric trouble is caused by a catarrhal or inflammatory condition depending upon a congested liver, a smart mercurial (5 grains calomel) at night, followed by a saline, will give relief. Should the dyspepsia be a part of the phenomena associated with renal disease, treatment directed to the uræmic state may afford rapid relief (See Bright's Disease, page 77.) Sometimes the sipping of hot water frequently through the day may give ease, and dyspeptics often get relief by sipping hot water before breakfast. Small doses of the mineral acids, if given immediately before a meal, seem to check the secretion of the gastric juice, and in mild cases of irritative dyspepsia this treatment sometimes gives relief; it, however, often aggravates. After the more acute or painful symptoms have been got under, treatment suitable to the atonic condition may be cautiously commenced—quinine, vegetable bitters, small doses of iron or arsenic. Ipecacuanha is very useful sometimes in small doses.

The medicinal treatment of *atonic* dyspepsia includes all remedies calculated to increase the functional activity of the stomach. Alkalies, if given in small doses before meals, have been demonstrated to increase the amount of gastric juice poured out by the enfeebled gastric glands, and when combined with suitable tonics are a valuable means of restoring function and improving digestion. The bicarbonate of soda is the best, but sometimes the potash, ammonia, lime, or magnesia salt may be selected. In large doses, a few hours after meals,

they act in a very different manner, and give relief by neutralizing the excess of acid present in the stomach, as mentioned under the head of acidity and irritative dyspepsia, and thus are of much value in relieving cardialgia and putting an end to acid fermentation. In atonic dyspepsia a good formula will be one containing 10 grains. bicarbonate of soda, with a few grains of subcarbonate of bismuth, and 15 minims of tincture of chiretta in 4 drachms of infusion of calumba or quassia to be taken half an hour before each meal.

As a powder the following is an excellent formula:

℞.—Sodii carb. exsiccat. gr. v.
Magnesii carb. gr. x.
Pulv. rhei gr. vj.—M.
Make twelve of these powders.

S.—Take one, three times a day, before meals.

Or,

℞.—Sodii carb. exsiccat. ℥j.
Pulv. rhei ℥vj.
Pulv. calumbæ ℥j.
Pulv. zingiberis ℥iv.
Pulv. Doveri gr. xxxv.
Quininæ sulphatis gr. xxv.—M.

S.—An eggspoonful in a little water before each meal; or a teaspoonful two hours after dinner if pain or acidity be distressing.

Notwithstanding the law formulated by Ringer that "acids check all acid secretions," there cannot be a doubt about the very great value of the mineral acids in the treatment of atonic dyspepsia.

Their value has been supposed to depend upon their supplying to the gastric juice something in which it is abnormally deficient. In whatever way they act the digestive process appears to be hastened and rendered less painful in some cases, but to produce this effect the acid must be given some time *after* a meal.

The dilute hydrochloric or nitro hydrochloric acid in doses of 20 to 30 minims, with quassia, calumba, chiretta, or better still, with nux vomica, given after each meal is about the best routine method of dealing with a chronic dyspepsia caused by deficiency in the gastric secretion or delay in the digestive process.

℞.—Acid. nitro-hydrochlor. dil. ℥vj.
Strychninæ sulph. gr. j.
Tinct. aurantii ℥j.
Tinct. calumbæ ℥j.
Infusi gentianæ ad ℥xij.—M.

S.—Take a tablespoonful, with a wineglassful of water, three times a day after meals.

Lactic, phosphoric, nitric, and other acids are also very useful. Pepsin in its various forms is of much value, and many physicians prefer to add the enzyme to the food, and so start or complete the artificial digestion before presenting it to the patient. It is of little use giving it after purely farinaceous food. The wine of pepsin may be given with dilute hydrochloric acid after meals. Lactopeptine in 10 grain doses, with $\frac{1}{20}$ grain morphine, and 2 grains quinine, may be given with advantage after meals, with or without bismuth. Pancreatin may be used in the same way. Papain has been used with much success by the writer in doses of 2 grains after each meal. The favorite recipe for atonic dyspepsia with the late Professor Gordon was one containing in each dose—1½ grains iodide of potassium, 5 to 10 minims ipecacuanha wine, and ½ ounce infusion of calumba.

Flint highly recommended 10 grains of salicin in 2 ounces of water, swallowed immediately before each meal.

One minim of Fowler's solution diluted with 2 drachms of water, and given ten minutes before each meal has been found to be followed with marked benefit in some cases.

One to 4 drachm doses of glycerin have been given with some benefit, a little nux vomica may be combined to destroy its intense sweetness, and some physicians combine with the glycerin 1 or 1½ minims of pure carbolic acid and 10 grains of bicarbonate of soda.

Massage and the continuous current, if regularly used, are of much value as adjuncts to medicinal treatment in atonic dyspepsia.

Wettendorfer, during the treatment of an eczema of the trunk by means of an elastic rubber bandage, noticed the entire disappearance of obstinate dyspeptic symptoms, and was thus led to treat all cases of irritable or painful dyspepsia by compression of the abdomen with a broad rubber bandage applied for one hour after meals. The ordinary hydropathic belt applied over a warm pad, as recommended by Dr. Kevin, acts beneficially.

Washing out of the stomach has been used in some cases with marked success. It has also been highly recommended in the dyspepsia of infants and very young children. After the contents have been removed, a stream of tepid water, bearing in solution some antiseptic as boric acid, creasote, boroglyceride, Condy's fluid, salicylic acid, or sulphurous acid, should be passed through the organ in order to thoroughly wash it out.

For the various symptoms arising during the course of chronic dyspepsia, the previously mentioned treatment will, in the majority of cases, afford relief, but sometimes special measures must be taken. Thus for

Vomiting, the writer has found that the minute perules of morphine ($\frac{1}{16}$ grain) are upon the whole, the most satisfactory treatment. Ice, bismuth (5 grains), creasote (1 minim), hydrocyanic acid (3 minims), codeine (¼ grain), arsenic ($\frac{1}{100}$ grain), carbolic acid (1 minim), effervescing mixtures, champagne, chloroform (1 minim), tincture of iodine

(1 minim), ipecacuanha (minim doses of the wine), have been recommended. This latter has signally failed in the writer's hands. Koumiss, pepsin, papain, pancreatin, lime-water, nux vomica (5 minims of tincture), cocaine (¼ grain), may be tried.

Counter-irritation over the stomach is useful when sarcinæ, with very yeasty, acid vomiting, are present. If creasote fails, sulphurous acid (1 drachm), sulphite of soda (16 grains), salicylic acid (10 grains), bichloride of mercury ($\frac{1}{25}$ grain), sulphocarbolates (20 grains), oil of eucalyptus, or of mentha piper. (3 minims).

Acidity if it fails to yield to alkalies, will not likely yield to acids in small doses immediately before meals. The writer has found that the best routine treatment is the creasote capsule; two may be given four times a day. (See the various methods of treatment fully discussed under the heading Acidity, page 15.)

Hamilton has, by an exhaustive study of the contents of the stomach at different stages of digestion, shown that in *acid* dyspepsia there is a distinct increase of acid present. Lactic and hydrochloric acids are normally present during digestion, but at different periods; and in acid dyspepsia it is lactic acid which is in excess. This is caused by a prolongation of the stage of lactic acid formation, and is favored by the absence of the normal amount of hydrochloric acid. Hence an obvious explanation of the benefit sometimes obtained by giving hydrochloric acid in these cases.

In other cases, however, large amounts of hydrochloric acid are formed, and this has been demonstrated to occur even during fasting. The only relief in these cases is to be obtained by large doses of alkalies.

The writer has satisfied himself that many cases of very severe acid dyspepsia are caused by great excess of butyric acid, and the cause of this is owing to the practice of stewing or baking fat meats for a long time at a high temperature in a close oven. The fat undergoes chemical change, and after being swallowed it readily ferments; and he has seen the contents of the stomach so highly charged with butyric acid that the epithelium of the throat has been removed or excoriated during vomiting, producing alarming symptoms. Large doses of alkalies, combined with papain, afford the best means of meeting such a difficulty. Roberts recommends that antacids should be used in the lozenge form, and while wisely condemning the two official antacid lozenges, he suggests that the B. P. bismuth lozenge should be made without the bismuth, and that 1 grain of chloride of sodium should be added in its stead. Vichy lozenges are excellent antacids for the dyspeptic. These antacids Roberts believes, when properly used, may be regarded as harmless, even when administered for very long periods. The bismuth lozenges he advises should not be used until after the expiration of three-quarters or one hour following breakfast, and one hour or more after dinner. The U. S. P. troch. sodii bicarb. and troch. magnesiæ may be used. Lime-water possesses very feeble

antacid properties, 15 grains of bicarbonate of soda being equivalent to about to about half a pint of the liquor calcis.

Flatulence is often a most obstinate symptom of dyspepsia, and the patient should be informed that the regurgitant or expulsive effort which he naturally makes in order to expel the gas from the stomach always causes air to be swallowed. In this way the gaseous contents never diminish, though gallons of gas are belched off in a few minutes, and the distress of the patient increases. He should be convinced that it is a mistake to make any attempt to "raise the wind." Friction, kneading, or massage of the abdomen may be tried with a view of dislodging the imprisoned gas. Many of the previously mentioned remedies, which stop fermentation and hasten the digestive process, will soon arrest the secretion of gas. Creasote is again of great service. Sulphites, sulphocarbolates, pepsin in large doses, and papain are also valuable. Carminatives like ginger, cloves, ol. menth. pip., caju-put, etc., give relief. Charcoal, freshly dried and given dry (wrapped up in wafer-paper), or in capsules, affords comfort and assists digestion by causing rapid absorption of gas. Poplar charcoal is preferred by many. It may be given with advantage before meals. Naphthalin has been given as a gastric and intestinal disinfectant, in 8-grain doses, with varying success. Boric acid is more certain.

Alkalies, as the carbonates of lime, magnesia, and potash, either alone or combined with strychnine, often afford relief. Asafœtida should be given by mouth or enema if the flatus is intestinal. Foods likely to ferment or decompose should be avoided, as soups, eggs, starch, and fruits. A dry diet—beefsteaks and biscuits of charcoal—is generally much more suitable than liquid nourishment, and the patient should be warned against taking much fluids after meals. Sometimes copious drinks of hot or warm water give relief, but their use ultimately aggravates matters. Alcoholic stimulants act in a similar way.

EAR, Diseases of.

The treatment of *eczema* of the auricle and meatus differs in no way from the treatment of eczema in other regions—the free use of an ointment in the early stages, containing 60 minims of liquor plumbi to 1 ounce of vaseline, with a few drops of a weak solution of the lead liquor (1 : 40) dropped into the meatus. After the acute stage is passed, liquor carbonis deterg. may be added to the ointment with advantage. The meatus should be occasionally filled with warm almond oil, and all secretion gently removed by mopping out the passage by means of absorbent wool upon a probe.

Hæmatoma of the auricle is best treated by a free incision, and dressing with a weak spirit lotion (1 : 5), to which bichloride of mercury ($\frac{1}{2}$ grain to 1 ounce) is added.

Bony growths, or aural exostoses, when blocking up the meatus, are

best removed by gouging, by grinding down with a dentist's drill, by sawing with the écraseur, by inducing caries through the use of the trephine, or through the use of a strong continuous current; the various methods suggested for dilating the meatus with tents or plugs without removing the growths are condemned by the best authorities.

Inflammation of the external meatus is most commonly caused by the presence of small furuncles, boils, or abscesses; these occur with disheartening regularity and frequency, and render the treatment of this condition most troublesome.

In the acute and intensely painful stage prior to the pointing of the abscess, leeches to the auricle, followed by hot stupes, give relief. Cocaine—the pure alkaloid *dissolved* in warm oil (4 per cent.)—affords some ease when dropped into the meatus.

Von Stein extols a combination of cocaine with resorcin in ear disease. He finds this relieves pain, and increases the absorbent power of the bloodvessels, diminishing secretion in a marked degree. He uses about 5 grains of resorcin and 25 grains of cocaine in 1 ounce of water, and drops a little into the ear, where it is allowed to remain for a short time before being soaked out on wool. Abscesses should be opened with a fine-pointed abscess knife, and speedy relief follows.

Since the writer learned that the pathology of these furuncles was probably parasitic, he was led to employ a solution of corrosive sublimate in their after-treatment with a view to prevent their recurrence, and the result was most satisfactory.

In one case which had lasted for years, notwithstanding the measures employed by more than one eminent specialist, the life of the patient was made very miserable for short periods every few weeks. The disease did not return after the use of the following solution had been commenced, though some years have elapsed. It was dropped into the ear twice a day, and afterward once a day, and the orifice of the meatus plugged with cotton wool also moistened by the solution:

℞.—Hydrarg. bichlor. gr. ij.
Spt. vini rectif. ℥vj.
Aquæ destillatæ ad ℥iij.—M.

S.—To be applied to the inside of the ear on cotton wool.

Where the inflammation of the meatus is general, and not depending upon furuncles, leeches, fomentations, and weak astringent injections, followed by dry boric acid, speedily cure the disease.

Fungi—aspergillus flav. and *nig.* are sometimes found infesting the meatus. They may be easily destroyed by the above liquid, diluted with an equal quantity of water. Dry boric acid insufflated, or a warm, strong alcoholic solution, soon causes their destruction.

Wax and *foreign bodies* in the meatus are best removed by syringing with warm water. The ordinary India-rubber enema apparatus answers very well, and it is hardly necessary to say that the nozzle should not

be introduced *within the meatus*, but should be held within a few lines of its orifice,

The auricle, when pulled upward and backward, permits the free flow of water in and out of the meatus, and by persevering for some time, the stream, getting behind the cerumen or foreign body, forces it out. If this fails, variously-shaped instruments devised for the purpose may be used; about the best is a loop of wire, gently coaxed past the obstruction and drawn forward. The loop-end of a fine polished hair-pin answers all purposes. Forceps, or a very small scoop, may occasionally be required.

Should there be much difficulty in removing the wax, it will be well to adjourn operations for a time, as prolonged syringing sometimes causes faintness, tinnitus, and deafness, owing to congestion or extravasation in the labyrinth. The introduction of a little solution of bicarbonate of soda (1½ grains to each drachm) for a few days greatly assists in the removal of the wax. Papain also assists the disintegration of wax and other concretions.

Acute catarrh of middle ear, if severe, will be best relieved by the application of two, three, or four leeches to the auricle.

Hot fomentations will encourage the bleeding from the bites, and give further relief. Should the pain be severe and the tympanum found bulging, an incision with a fine, sharp, double edged knife or needle gives speedy relief.

When the symptoms are not very acute, the case often yields to a few inflations of the tympanum by Politzer's bag. By inserting the nozzle of an ordinary enema apparatus well up into the nostril of the affected side, and forcibly injecting air at the instant when the patient is in the act of swallowing a little water, the air is driven through the Eustachian tube, and obstructions caused by accumulations of mucus may be easily overcome.

The naso-pharynx may be douched with weak saline solutions—boric acid, chloride of sodium, borax, or bicarbonate of soda (100 grains to half a pint of tepid water). Dry boric acid in fine powder may be blown up the nostril by means of an insufflator.

If the catarrh resists the above treatment, and shows signs of passing into the chronic form, the Eustachian catheter may be passed, and a weak astringent solution, if there be evidence of much mucus secretion, should be injected. The strength of the solution varies, but, generally speaking, about the strength of an eye lotion—1 grain of zinc sulphate to 1 ounce of warm water. If the tympanic cavity contain thickened mucus—the remnants of an acute attack—some experts make a linear incision in the tympanic membrane, and, through the Eustachian tube by means of the catheter, wash out the cavity by a stream of weak alkaline solution injected into the external meatus.

Chronic catarrh of the middle ear is best treated by remedial agents directed to the cause of the obstruction often existing in the Eustachian

tube, constant inflation of the tympanum by Politzer's method, or the Eustachian catheter with attention to diseased conditions of the naso-pharynx by local applications, or by the chloride of ammonium inhaler. In very bad cases the incision of the membrane, and the injection of alkaline solutions, as just mentioned, may be tried, or Leil's operation for division of the tensor tympani muscle may be suggested.

Acute purulent catarrh should be treated just as if a case of acute simple catarrh of the middle ear, from which at first in cannot be distinguished. If perforation of the membrane has already occurred, there may be afterward difficulty in getting the opening to close. It is better, for this reason, to incise the membrane early if the case comes under notice before perforation has occurred. Constant syringing with weak antiseptic solutions (10 grains of boric acid to 1 ounce, or 3 grains of zinc sulphate to 1 ounce of water) must be carefully done at least twice daily.

M. Shield has directed attention to the difficulty in having agents in the dry state applied to the interior of the ear, and he has wisely recommended the use of small pellets of round suppositories about the size of a swan shot, which quickly melt in the meatus and keep it aseptic for hours. In this way iodoform, tannin, boric acid, and other agents may be easily used by the nurse or patient's attendant.

Inflation of the tympanum by Politzer's method should be daily performed before syringing.

Mastoid swelling and tenderness may be relieved by one deep incision. The condition of the naso-pharynx must be carefully made right by local astringents and antiseptics. Gargles—tannin (1 : 30), chlorate of potash (1 : 40), carbolic acid (1 : 80) may be employed. It is a good plan to brush out the throat with glycerin and carbolic acid (1 : 10), tincture of iron and glycerin (1 : 2), or nitrate of silver (1 : 20).

Chronic purulent catarrh requires treatment generally for the perforated state of the membrane. Constant syringing with very weak carbolic solution (1 : 120), and insufflations of dry powdered borax, are the safest means of restoring a healthy condition of the affected parts. An instillation of warm alcoholic solution of boric acid (1 : 20), or of strong spirit of wine, may be tried.

Mackenzie Johnston has used a solution of papain for cleansing the middle ear in cases of suppuration, with the view of causing disintegration of the masses of dry pus or *débris*. He drops in 15 minims of a 5 per cent. solution into the ear so that it may reach the bottom of the meatus. One hour afterward the ear is to be syringed out with warm boric acid lotion. Papain should be a good means of treating cholesteatoma of the middle ear by means of the syringe and tubes used by Dundas Grant.

The Eustachian tube should be daily kept clear by inflation. Exuberant granulations around the perforation may be kept in check

by the application of caustics, as the solid or mitigated stick. Ultimately the opening, if it does not close of itself, may be temporarily stopped up by an artificial tympanum of India-rubber, like Toynbee's, or of the membrane which lines the interior of the egg of the common hen, or the opening may be closed by a moistened plug of absorbent cotton wool pushed through the meatus by means of special forceps until it rests against the perforated membrane. This plug or wad should be renewed every morning.

Mastoiditis should be promptly met by leeching, and as soon as pus is evident a large, deep incision down to or through the periosteum. If matter be not reached, and brain symptoms are present, trephining should be resorted to without delay. Where dead bone exists, its early removal is necessary.

Polypi, which commonly appear during the course of chronic purulent catarrh, should be removed by the snare-forceps or ring-knife.

EAR, INTERNAL, Diseases of.

The treatment of the various groups of symptoms found associated with abnormal conditions of the nervous structures in the ear is very unsatisfactory.

Syphilitic affections, if of very long standing, are almost hopeless. Mercury by inunction in the early stages will give good results. At a later period, large doses of iodide of potassium (20 to 30 grains), with frequent mastoid counter-irritation, may be tried.

Tinnitus aurium may be treated, with some slight benefit, by large doses of bromide of sodium (30 grains three times a day). The various suggestions for counter-irritation of the mastoid, the hypodermic injection of nitrate of pilocarpine, electricity, puncture of the tympanum, etc., are generally useless. The instillation of cocaine has sometimes given considerable relief, and this is supposed to result from its influence on arterial pressure.

Menière's disease has been treated with occasional success by large doses of quinine (5 to 10 grains), bromides (30 grains), salicin or salicylates (30 grains); digitalis, 10 minims of the tincture, every four or eight hours, has been tried along with counter-irritation over the mastoid and the continuous current. (See also under the separate heading of Tinnitus.)

ECLAMPSIA—See Puerperal Convulsions.

ECTHYMA.

The original affection of which this is the cause must be treated. Thus, prurigo, scabies, pediculosis, or any condition or affection of the skin accompanied by much itching, may be the origin of ecthyma, and this condition will rapidly disappear upon the removal of these causes.

The affection is generally only seen in the filthy, those badly fed and unhealthy; and the indications in such cases are scrupulous cleanliness, good plain food in abundance, and improved hygienic surroundings, with cod-liver oil, tonics, and proper clothing. The local treatment must be directed to the primary affection; crusts and scabs should be removed by poulticing or warm water, and a mild astringent ointment then applied to the base of the pustule. Zinc ointment with ½ drachm of liquor plumbi to each ounce, answers well in most cases. Lotions covered by oiled silk are to be avoided.

ECTROPION—See Entropion.

ECZEMA.

The treatment of this common ailment is one of the most difficult problems that comes before the physician. Unfortunately, there are some cardinal principles about which authorities differ, but too much is made out of these differences. The vexed question of the local *versus* the constitutional origin of eczema is a stumbling-block. It appears almost certain that both views are correct, and the error to be guarded against is the common one of taking either side of the question to the exclusion of the other. This, at the start is a matter of vital importance as regards treatment. The physician who always regards eczema as a purely constitutional disorder, to be purged out or drugged out of the system, will continue to treat eczema with internal remedies long after the constitutional condition which caused it has been remedied. Upon the other hand, he who looks at the ailment exclusively from the local standpoint may find himself treating a case of the disease solely with topical remedies long after the original local cause which called the eczema into existence has disappeared, the condition being, in the meantime, kept up by some constitutional error. This constitutional error may be a factor possessing enough power to keep up the eczema when once produced by a local irritant, though it possibly, of itself, might never have been able to establish the disease. Hence the treatment of eczema must be both constitutional and local, and clinical experience amply proves that, upon the whole, the local treatment is much more successful in the great majority of cases.

Diet must be carefully attended to, especially in acute cases, and upon the whole, a purely milk diet, in the absence of special contra-indications, is the best where any considerable portion of integument is involved.

In chronic cases, a good, generous mixed diet may be permitted, but sugar and coffee in any quantity should be forbidden, and all salted meats, pork, shell-fish, cayenne, spices, pickles, raw fruits, pastry, and cheese, should be partaken of with great caution. Any food or article of diet which the patient has found to aggravate the itching in the eczematous spot, must not be again indulged in. Some patients feel that the smallest sip of wine, in a very short time after being

swallowed, produces tingling and itching in the seat of the eczema, and this is especially true if the head, face, or neck is affected. Upon the whole, stimulants must be allowed in very sparing quantity, and, where indicated, whiskey is the best. Acid wines are especially hurtful, and English beer, as a rule, should be forbidden. Lager beer is much less objectionable. In the presence of dyspepsia, or other gastric trouble, the dietary suitable to the patient's needs must be selected.

Everything that will improve the hygienic condition of the patient, as to proper rest, exercise, sleep, clothing, sunshine, cookery, etc., must be seen to when found to be faulty.

Change of air, scene, and occupation afford marked benefit in some cases, and, upon the whole, except in very chronic cases, a bracing sea air or sea voyage is not to be recommended without serious misgiving.

Internal treatment may be summed up by saying that the object of medicinal interference should be to correct any abnormal conditions present in the organs or secretions. Thus dyspepsia, or acidity, should be counteracted by appropriate remedies, and constipation by laxatives or purgatives. The use of these latter in chronic eczema, is universally acknowledged. Salines are especially valuable. Friedrichshall, Carlsbad, Püllna, Hunyadi Janos waters, or Rochelle or Epsom salt may be used. There is no better saline than the "white mixture" given early in the morning while fasting, so as to produce one or two copious motions of watery consistence.

℞.—Magnesii sulphatis ℥ij.
Vini colchici ʒjss.
Magnesii carbonatis ʒiij.
Aquæ menthæ pip. ad ℥xij.—M.

S.—Take a wineglassful early every morning.

Another favorite saline combination in these cases in a mixture of—

℞.—Magnesii sulphatis ℥ijss.
Ferri sulphatis ʒss.
Acid. sulphurici dil. ʒijss.
Aquæ dest. ad ℥xvj.—M.

S.—A large wineglassful to be taken in half a tumblerful of water every second morning, and to be repeated in three hours if the bowels be not well moved.

The saline should be occasionally preceded by a good dose of blue mass given at bed-time. It is manifest that this purgative treatment cannot be pursued for long periods without serious drawbacks. In the intervals the bowels will likely become very obstinate, and cascara or aloes, in properly regulated doses, as mentioned under Constipation (page 144), should be employed.

Where the tongue remains furred and appetite bad, especially where

there is a dry skin and scanty urine, an effervescing mixture containing 1 ounce bicarbonate of potash and 1 drachm acetate of potash, dissolved in 10 ounces of water, may be given in doses of 1 ounce with ½ ounce fresh lemon juice three times a day, to be swallowed during effervescence.

Where eczema is associated with anæmia there is no iron preparation better than Blaud's pill.

In chronic cases associated with enlarged veins and a weak heart or diseased mitral valve, the eczema of the lower extremities is much improved by a combination of iron and digitalis.

Internal remedies may be called for to allay itching and sleeplessness. Opium, morphine, or chloral should not be used for this purpose. Sulphonal, in 20 grain doses, may be tried, but large doses of the bromide of sodium (30 grains) allay restlessness, without producing any untoward results.

Pye-Smith strongly recommends chloral in the eczema of children in order to insure sleep and prevent scratching.

Gelsemium may be given alone or in combination, it sometimes allays itching in a marked degree (15 minim doses of the tincture). Belladonna or hyoscyamus in full doses may give sleep where opium cannot be given on accouut of its after effects upon the nerves of the skin. Quinine has the power of preventing itching in young subjects when given in full doses one hour before bed-time. Antipyrine is better, and acts when given in small doses (5 grains).

Tartarized antimony certainly appears sometimes to have a modifying effect upon the course of eczema, especially in the more acute or subacute cases. Small doses only should be given. $\frac{1}{16}$ grain in solution three or four times a day may be given for ten days.

Hypophosphites, phosphates, malt preparations, cod-liver oil, chalybeates of every kind, iodides, chlorate of potassium, iris versicolor, lithium, viola tricolor, rhus toxicodendron, tar, sulphide of calcium, turpentine, copaiba, guaiacum, and scores of other drugs have been vaunted from time to time as specifics for eczema when administered by the mouth.

Arsenic is, however, a drug about the value of which there is no doubt in chronic eczema, and it is indeed the only drug which in our present knowledge can be said to constantly modify the diseased action in this troublesome ailment.

It may be stated, as a rule, that arsenic is of value in proportion to the chronicity and dry or scaly state of the eczema, and it is almost equally true that it is, or may be injurious in the acute stage. One might safely tell the student that the nearer a case of dry chronic eczema, with its scaly surface and thickened base, comes to resemble psoriasis, the more clearly does the internal use of arsenic become indicated.

It should be given in full doses, and it will be found unnecessary to push it to the extent of producing the physiological action of the drug.

Beginning with 3 minim doses of Fowler's solution after each meal, in about a fortnight 10 minim doses may be reached.

Iron in small doses may be combined with the Fowler's solution in many instances with advantage. Hutchinson regards eczema as a local disease, and he believes that arsenic rarely does good, and that it often irritates.

Pilocarpine has been given hypodermically in cases where the skin has remained dry and harsh, and good results have been reported.

Electricity, in the form of the continuous current, has been used with advantage in inveterate cases.

The *local* treatment of eczema might easily be made to fill a volume larger than the present. Only the more important leading principles and chief details can be enumerated. There is no specific for eczema —no royal road to its successful treatment, though there are few diseased conditions so susceptible to improvement or permanent cure. The secret of success in treating eczema lies for the most part in the ability of the physician to use the proper remedy at the various stages of the disease. The class of agents so valuable in the acute are worthless in the very chronic stages, while remedies of unfailing power when used in the chronic cases are fraught with serious danger when applied at the earlier stages of acute cases. The physician who wishes to treat the protean forms of eczema with success must learn to be patient, ever remembering that in the majority of cases the progress towards recovery is a slow one, and having fixed firmly before him the principle upon which his treatment is based, he should be content to wait till his local remedy has had time to act, before its failure is accepted. The constant chopping and changing of applications from day to day is one of the great causes of failure in the management of chronic or acute eczema.

The writer before he had realized the natural progress of the affection through the hyperæmic to the papular, vesicular, pustular, weeping, scabbing, and scaly stages, had much disappointment in the results of treatment. He can recall cases now which were progressing towards recovery when an unfortunate impatience tempted a change in the local remedy, and cause the disease to break out afresh and run through all its stages over again. Had the treatment only been continued for a few days or weeks longer in these cases, uninterrupted recovery would have been the result.

Acute eczema calls for soothing and bland applications. If seen at the very early stage the treatment should consist in the free smearing over of the part with an inert oil or grease, to protect the irritated surface from the action of the atmosphere or from changes in temperature. But it is useless to cover over the seat of disease with ointments until scabs or altered or dried secretions have been thoroughly removed. These must be removed by one good cleansing with soap and water, by poulticing, or by bathing. This application of soap and water should not be repeated, and the rule should be laid down that the parts

affected with acute eczema should not be washed, soaped, or poulticed till convalescence is fully established. At a later stage, and during the progress of treatment, secretions may be easily removed by applying olive oil freely upon absorbent wool and gently wiping the part clean. If soap must be used, an over-fatted basis soap should be selected. Everything that can cause irritation, such as the friction of the dress rubbing against the part, profuse sweating, alternations of temperature, exposure to the air, scratching, etc., must be guarded against.

In the early acute stage the indication is, as just mentioned, to soothe, cover over the painful part, and to protect it from all external sources of irritation. For this purpose lotions, dusting powders, pastes, oils, or ointments may be applied, and it is difficult to lay down any fixed rule for the selection of these remedies. The writer seldom uses lotions at this stage, unless astringents are required. Lotions must be applied on lint, and should not be covered with oiled silk, as they soon become poultices if this be done. The lint should never be allowed to dry, but constant moistening with the lotion must be kept up. This is impossible at night; ointments are consequently much more convenient, and the best for routine treatment is the unguentum zinci oxidi. It may be made of firmer consistence by the addition of more of the oxide or of the impure carbonate. The following is a good formula:

℞.—Unguent. zinci oxidi ℥ij.
Zinci carb. præcip. ʒij.—M.

Or,

℞.—Unguent. aquæ rosæ ℥ij.
Zinci oxidi ʒij.
Zinci carb. præcip. ʒj.—M.

Or MacKintosh's formula may be used:

℞.—Zinci oxidi ʒj.
Bismuthi subnit. ʒiv.
Glycerini purif. ʒiij.
Acid. carbolici ♏xl.
Vaselini albi ℥jss.—M.

Powdered arrowroot, 1 drachm; oxide or carbonate of bismuth, 1 drachm; cold cream, 1 ounce, makes a bland, soothing covering. Formulæ might be given to any extent—the above meet most requirements. The ointment should be freely smeared over the surface, which should be then covered with lint, or old linen upon which a layer of the ointment has been evenly spread. Pure olive, almond, or linseed oils, or any of these mixed with an equal quantity of lime-water, may be used. If secretion be profuse, after the mild ointment has been used for a few days an astringent should be added to it. Lead in some form is the best. 1 drachm of the strong liquor of the subacetate may

be added to each 1 ounce of zinc ointment. Hebra's diachylon ointment is a good one.

It is in those cases of acute weeping eczema that lotions may be used for a time with advantage. The dilute subacetate solution is a favorite; a few minims of laudanum may be added to each ounce.

In acute eczema, with very profuse secretion, powdered starch, arrowroot, carbonate of lead, carbonate of zinc, carbonate of magnesia, powdered Fuller's earth, oxide of zinc, French chalk, bismuth oxide, subnitrate or subcarbonate, lycopodium, powdered rice, and talc, may be mixed in various proportions, according to the amount of astringent action required, the lead being the most active in this respect.

Where itching is smart, camphor in fine powder should be added to the above in the proportion of about 10 grains to each ounce of powder.

Pastes are becoming extensively used in the treatment of eczema. They possess the great advantage of absorbing the aqueous secretions of the skin, which are pent up under the ointments, and they leave a firm, powdery residue on the skin not easily removed by friction, thus fixing the active ingredient.

Lassar's paste consists of 2 ounces of vaseline, 1 ounce of starch, 1 ounce of oxide of zinc, and 40 grains of salicylic acid. With this paste he envelops the entire body of an infant suffering from acute eczema, after having previously washed it, and touched any bleeding spots with a solution of caustic. The face, head, and joints are smeared over with a 2 per cent. ointment of salicylic acid in vaseline, and muslin bandages are firmly applied.

Unna makes a paste by adding a small quantity of silica to zinc ointment. Bulkley adds to the zinc ointment a small quantity of ichthyol and salicylic acid, and thus makes a very efficacious combination.

Lanolin, lard, or vaseline, may be used as the basis of a paste made with any of the previously mentioned powders.

Glycerin in undiluted form should never be used in acute eczema. Unna's glycerin jelly consists of glycerin, 25 parts; water, 45 parts; gelatin, 15 parts; and oxide of zinc, 15 parts; to which any ingredient may be added. Unna allays the burning itch of acute dry eczema by painting on this paste, warm, with a camel's-hair pencil.

Should the acute eczema not resolve within a short time under the above treatment, more stimulating measures will be called for, and it may clinically be regarded as a case of sub acute or chronic eczema, and treated accordingly.

Chronic Eczema.—If the affection has failed to respond to the soothing treatment, or if it has existed for a considerable period before coming under observation, applications of a more stimulating nature are demanded. The list of local remedies for chronic eczema seems almost without end. The old drugs, which have stood the test for ages, are, after all, better, more certain, and more lasting than their modern rivals. Thus tar, mercurials, and lead will cope, if skilfully handled,

with most chronic forms of the disease. Upon the whole, ointments will be found more convenient and efficacious than lotions, though these latter are indicated under special circumstances. If there be very much exudation or moisture, the greasy nature of the ointment keeps the secretion in contact with the irritated surface. In some cases this is a serious drawback, and the discharge is, of itself, an irritant, and prolongs the mischief. In these cases a lotion containing an astringent must be used to check secretion. After an appreciable effect has been obtained in this direction, a stimulant like tar can be combined with the astringent lotion. The amount of stimulating ingredient must be small at first, and gradually increased, the physician cautiously feeling his way before employing strong remedies.

A tar preparation which may soothe and quickly heal an itchy, dry eczema, associated with much infiltration, may act like fuel to the fire when applied to a moist, weeping, red eczema. It is a good rule, with chronic, weeping eczemas of this kind, to begin with lead lotions containing a sedative to allay itching and heat; afterward tar can be safely used.

The strong liquor plumbi in water (1 : 40), to which a ¼ part of laudanum or camphorated spirit is added, soon allays itching and diminishes secretion, but the number of cases in which an astringent ointment cannot be used instead is small. Liquor carbonis deterg. may be added to the above lotion with advantage (1 : 80).

One of the best ointments ever used in chronic eczema is the following. It is astonishing to find the number of cases in which it can be used advantageously. The proportions of the different ingredients may be altered to suit the symptoms or peculiarities of each case.

℞.—Liq. carbonis deterg. ℥j
Hydrarg. ammon. gr. x.
Lanolini ℥j.—M.

If much secretion be present, 1 drachm of liquor plumbi may be added. Should there be dryness instead, with scaliness, the tarry ingredient may be safely doubled in amount, while the mercurial may be equally increased.

Oil of cade, oil of white birch, creasote, carbolic acid, beta-naphthol, or naphthalin may be used instead of the liquor carbonis, which is a saturated solution of coal-tar in rectified spirit. The U. S. P. ointment of pix liquida is a good application, but should not be applied to hairy regions. It may be diluted with 1 to 4 parts of zinc ointment with advantage in most cases.

The same rule which guides the student in selecting arsenic in the treatment of chronic eczema applies equally to tar and its preparations —*i. e.*, the nearer the case appears to approach to psoriasis, the better will tarry compounds act.

The cases of chronic eczema where tar is unsuitable are very few,

and, as a rule, it may be said that where tar fails it is because it has been used in a too concentrated form. Hutchinson regards tar as the one remedy for eczema. If he uses two, they are tar and lead; if three, tar, lead, and mercury.

Pastes, as mentioned under acute eczema, are equally valuable when employed in the treatment of the chronic affection.

Lassar's paste may be used as the vehicle for any of the above-mentioned more active remedies.

Unna uses ichthyol, 10 or 20 per cent., or sulphoichthyolate of ammonia, 2 per cent, which may be incorporated with the paste.

Pick now treats the moist stages of all eczemas by his salicylic soap plaster, the formula for which is 5 parts of salicylic acid to 100 parts of liquefied soap plaster. When a weaker and more adhesive plaster is required, he mixes 2½ parts of the acid with 20 of olive oil and 80 of soap plaster. These are spread upon strong calico, cut into strips, and firmly applied to the moist surface, where they may be allowed to remain undisturbed for several days. The itchiness is replaced by a burning pain, which rapidly disappears. Four days suffice for the first application before removal. Subsequent dressings may remain one week each. Sometimes three weeks may be allowed to pass without change of the dressings.

When the scaly or dry stage is reached, the treatment by the sublimate gelatin is indicated. This elegant, transparent, and elastic dressing is prepared by dissolving 30 parts of pure white gelatin in water over a water-bath, and evaporating the liquid solution till its weight is reduced to 75 parts; 25 parts of glycerin and .05 bichloride of mercury are then added. This is simply painted on after the plaster has been removed, and it can be allowed to remain for days.

Mercurials come in, in chronic eczema, in those cases where the use of strong, tarry preparations is doubtful—*i. e.*, in subacute cases, where there is not yet much induration, and where redness and irritability lead the physician to doubt the wisdom of using tar; or they may be combined with tar to great advantage. They should not be employed where a very large surface is affected. A dilute solution of the bichloride (1 grain to 2 ounces of water) is an excellent alterative, and may be used with great advantage as a lotion where crusts, scabs, and dried secretion cover over and irritate the already inflamed surface. But perhaps the best of all the mercurial preparations is an ointment of the white precipitate (of the strength of about 20 to 30 grains per ounce).

Calomel, in similar proportions, often acts well. The dilute citrine ointment (1 : 8) is sometimes very valuable. These mercurials may be combined with zinc, lead, tar, or other remedies.

The unguentum metallorum, containing zinc, mercury, and lead, is a favorite with many skin specialists. It may be made by mixing equal quantities of the B. P. ointments of benzoated zinc, acetate of lead, and citrine ointment.

In very chronic profusely secreting eczemas, great relief and improvement have been obtained by painting over the weeping surface with a solution of silver nitrate (30 grains to 1 ounce).

For very chronic dry eczema, painting over the patches with blistering liquid or liquor potassæ sometimes gives good results, and Morris uses papain in some cases where there is great induration.

Lustgarten uses the following combination for eczema of the anus and genitals: oleate of cocaine, 2 parts; lanolin, 40 parts; olive oil, 10 parts, applied twice a day, followed by some absorbent dusting powder.

Sulphur, in the form of ointment (1 drachm to 1 ounce), may be tried in very chronic dry cases, or pyrogallic acid (½ drachm to 1 ounce), chrysophanic acid (15 grains to 1 ounce), glycerin of tannin, alcoholic solution of soft soap, boric or salicylic acids, alkaline lotions, eucalyptol, thymol, or chloral (15 grains to 1 ounce), glycerin of borax, or alum, resorcin (1 drachm to 1 ounce), iodol, or iodoform (10 grains to 1 ounce).

Papain and pancreatic emulsion are recommended for the removal of thickened epidermis, and salicylic acid, dissolved in collodion, may be used for the same purpose before applying any of the astringent ointments.

Unna, in seborrhœic eczema, uses resorcin. He states that there is no stage, no region, no age, no skin, nor any complication in which this drug may not be used, save in those rare cases of resorcin idiosyncrasy. He gets the best results from a solution of 10 parts of resorcin and 10 parts of glycerin in 180 of strong spirits. Thin layers of cotton wool are soaked in a mixture of 1 part of this solution with 4 of water, laid upon the part, and covered with oiled silk. The horny layer swells, and the resorcin must be stopped, and greasy ointments applied, till cure results. Thickening and induration of the skin rapidly yields to resorcin when employed in this manner.

Hans Hebra has recently introduced, under the name of glycerinum saponatum, a very elegant basis for ointments, and one which can be employed in chronic or acute eczema with advantage. It is a combination of glycerin with an absolutely neutral cocoanut oil acid soap. It is made of two strengths. One contains 80 per cent. of glycerin and 20 of the soap basis, the other contains 92 per cent. of glycerin and 8 of the soap. Numerous combinations of this substance, with active skin remedies, are made. One of the most valuable is the zinc oxide glycerinum saponatum with amylum. It is useful in both acute and chronic eczema, and consists of 78 parts of the 92 per cent. glycerinum saponatum, 20 parts of zinc oxide, and 2 of powdered starch. The reader will get full descriptions of other useful combinations in the *Edinburgh Journal*, September, 1890.

The above are but a sample of the interminable host of eczema remedies, but the physician who selects the older remedial agents, as lead, mercury, tar, and zinc, will be surprised to find how seldom he will fail

to cure with them, and how seldom he will have to seek the newer drugs for the relief of the commoner symptoms or complications.

The Martin's rubber bandage may be used with great advantage in the treatment of chronic eczema of the lower extremities, which so frequently is found associated with a varicose condition of the superficial veins.

A careful adherence to the details already mentioned will enable the student to treat eczema upon whatever part of the body it may be located, without a special description of the treatment of each of the so-called special varieties.

ELEPHANTIASIS.

During the febrile attacks which come on at the different stages of this affection, the treatment will be that indicated in ague. Antipyretics, like quinine, antifebrin, boiled fresh lemons, arsenic, iodine, and diaphoretics with mild saline purges. The local remedies are very uncertain in their action. The best appears to be the mercurial biniodide, made as an ointment and rubbed well into the hypertrophied tissue. It should be used of such strength as will not cause marked skin irritation, and where the situation of the tumor permits of firm continuous pressure being applied some form of elastic bandage may be used, and the affected parts placed in a position of absolute rest. At the same time they should be so elevated as to insure free circulation. Massage has been found useful in a few cases in the early stage.

The above measures will cause the disappearance of the disease in some cases, provided the patient is at once removed from the locality where the affection was contracted.

In advanced forms of elephantiasis, accompanied with great hypertrophy, these remedies are ineffectual. Blistering, electricity, mercurial inunctions, digital compression of the main arteries, and even ligatures of the chief bloodvessels, though sometimes followed by great improvement are generally powerless to remove the hypertrophied tissue. If the leg be the part affected these means may be continued for a long time, and by their use combined with the continuous application of the elastic or India-rubber bandage, amputation may be avoided.

Where the scrotum is affected the only satisfactory method of dealing with the tumor is to dissect out the penis and testicles with the spermatic cords, and remove the entire tumor with the knife without attempting to form any flaps.

Tumors, weighing as much as a hundred-weight, have been thus removed, and the patient after a few months has been completely restored to health. By the skilful employment of numerous good assistants and the judicious use of Esmarch's bandage, the operation may be rendered as safe as an ordinary amputation and almost bloodless.

In some desperate cases penis and testicles must be sacrificed by dissecting out the patient from the enormous tissue.

EMPHYSEMA OF THE LUNG.

The treatment of this affection in the first instance will mean the treatment of the disease which has produced the emphysema. Bronchitis, acute or chronic, pertussis, asthma, and other diseased conditions of the pulmonary organs associated with prolonged or violent expiratory efforts of coughing are the direct cause of the complaint whose management is now under consideration.

It will, therefore, be for the most part useless to think of removing the emphysema in the presence of a chronic bronchitis. In the treatment of chronic bronchial catarrh, with this object in view, remedies which render the sputum more liquid and less adhesive should have the first place; secondly, remedies should, if possible, be used at the same time with a view to prevent all unnecessary coughing.

Thus in the various forms of dry bronchial catarrh, especially in the variety observed in those whose occupations compel them to breathe air charged with fine dust, the incessant attempts at the expulsion of the irritating particles lead to the establishment of pulmonary emphysema of a severe type. The cough remains after the patient has ceased to breathe the irritating atmosphere, and it is out of proportion to the amount of bronchial inflammation present. The use of a stimulating expectorant, like iodide of potassium or apomorphine, combined with morphine, is of the greatest service in such cases. The treatment of the various forms of bronchitis is already mentioned under bronchitis (see page 82) and need not be again enumerated.

Very often the physician will meet with patients whose lungs are much involved with emphysema; nevertheless they suffer no inconvenience except when laboring under at attack of bronchial catarrh. It such cases the greatest relief follows the judicious use of expectorant medicines.

The question, however, of great importance is whether anything can be done to remedy the emphysema in the intervals between the bronchial attacks. There are very good grounds for regarding the starting-point of the lesion in the air vesicles as a degeneration. This being so, remedies which will have a contra effect will of necessity be of the greatest service. Foremost among these will be improved hygienic conditions and everything that will tend to raise the standard of health.

The excretory organs must be stimulated by gentle purgatives and active open-air exercise. The digestive functions should be improved when possible by attention to diet and tonics. The condition of the blood may be altered for the better by a course of arsenic or iron, or both. Arsenic is undoubtedly the best drug which we possess for the treatment of emphysema. It must, however, be given for a long time with great regularity, and the dose need not be large in order to obtain the best results—2 or 3 minim doses of Fowler's solution with each meal.

Next to arsenic will come cod-liver oil and iodides. The iodide of

potassium has the great advantage of being one of the most valuable of expectorants and anti-asthmatics, and at the same time it acts as an alterative, and stimulates the entire glandular system. It may be given at the same period as the previously mentioned remedies, or in courses of a few weeks' duration, and alternating with them. Hypophosphites are also very valuable.

Various remedies are recommended for the breathlessness, but as a rule only those are of value which act upon the bronchial irritation nearly always present. Thus of inhalations, oxygen, terebene, spray of vin. ipecac., turpentine, eucalyptus, iodide of ethyl, and the whole army of expectorant medicines internally, especially grindelia, have been tried.

Depressing expectorants are injurious in the majority of instances, as they interfere with the appetite, and may seriously tell upon the dilated heart, with its thinned walls. Their use should be occasionally suspended during the treatment of the chronic bronchitis present.

Attempts have been made, from time to time, to treat emphysema independent of the affections from which it has arisen, and the treatment by compressed air has been followed with satisfactory results in some cases. This is carried out in various ways:

1. The patient is made to inspire condensed air and to expire into into rarefied air. The pressure exceeds the ordinary atmosphere by about $\frac{1}{60}$. The inspiration of the compressed air causes more oxygen to enter the alveoli, while the expiration into rarefied air ($\frac{1}{60}$ less pressure than ordinary) causes more carbonic acid and residual air to leave the air vesicles. There is therefore an unusually brisk and complete exchange of gases and an increase in the respiratory movements, which it is affirmed produces or leads to increased elasticity in the pulmonary tissue. The treatment must extend over several weeks.

2. It is found in practice to be much more satisfactory to cause the patient to sit and breathe for a couple of hours daily in a chamber, the atmosphere of which has been gradually compressed to the extent of about $\frac{1}{4}$ of an additional atmospheric pressure.

This atmospheric chamber or compressed-air bath in a short time (according to Williams) causes the patient to breathe much easier, deeper, and slower. As the cardiac and hepatic dulness increase, the true vesicular murmur reappears. The vital capacity increases, while the circumference of the thorax diminishes. An air bath of this kind every other day for two months is generally considered sufficient. The general nutrition of the body improves, and digestion is quickened and appetite augmented.

A mixture of carbonic acid gas and pure oxygen (1 : 4) has been given as an inhalation (about 40 gallons per diem) with the same objects, but the results are far from satisfactory. The same remark applies to inhalations of oxygen and ozone.

In advanced cases of the disease the heart is generally dilated to a considerable extent, and the cardiac tonics—strophanthus, digitalis,

sparteine, strychnine, and caffeine—always afford some relief. A dry climate is the best, but high altitudes are generally not to be recommended.

EMPHYSEMA (General).

The extravasation of the air into the cellular tissue of the body seldom calls for active interference. Unless the accumulation of air becomes so extensive as to jeopardize life by embarrassing the action of vital organs, the case had better be left alone, as absorption always takes place spontaneously. Bandaging of the entire body from the toes to the chin has been successful in a few cases. Should suffocation threaten, the skin may be tapped by a Southey's trocar and canula in several places at once, or several incisions may be made by an abscess knife.

EMPYEMA.

As soon as the presence of pus is demonstrated in the pleura by the hypodermic syringe, aspirator, or exploratory trocar or grooved needle, no time should be lost in securing its removal. Delay means danger for several reasons, chiefly on account of the risk of the lung becoming so fixed and bound down by adhesions that expansion may never occur.

From the success in a very limited number of cases which has been known to follow the removal of the purulent fluid, the physician will be justified in first trying the effects of drawing off the pus by any of the ordinary methods before he resorts to free incision or resection of ribs.

The usual site in the axillary line about the fifth or sixth space may be selected, unless some intercostal space reveals marked bulging below or behind this region, when it may be selected. A trocar and canula, or any of the numerous forms of aspirators, may be used. A very convenient form of instrument is a canula, to which a fine India-rubber tube is attached through the intervention of a short branch near its collar. The trocar of this apparatus works in the canula like a piston-rod, and after both have been inserted into the pleural cavity, the trocar is withdrawn so that its point clears the opening into the branch of the canula to which the tubing is attached. The branch is furnished with a stop-cock. If the free end of the tubing (which should be about six feet in length) be dipped into some antiseptic fluid in the bottom of a basin placed under the patient's bed, and the stop-cock be now turned on, the purulent contents of the pleural cavity may be syphoned into the basin without any risk of air being admitted into the chest.

As much fluid may be removed as will flow spontaneously through the tube without causing symptoms of cough, dyspnœa, or faintness.

Should such embarrassments arise the stop-cock may be closed for a time, and they will generally pass off.

The instrument is so made that the trocar cannot be completely withdrawn from the canula, and it possesses this great advantage that when the latter is blocked up by clots or plugs of fibrin its lumen can be easily cleared by simply pushing back or driving home the trocar, and pulling it forward again.

The instrument should be thoroughly rendered aseptic by immersion in carbolic or weak bichloride of mercury solution. The patient may lie in bed with the shoulders well proped up by pillows.

Aspiration may be resorted to, but it is not safe to use the hollow *needles* in tapping the chest, their sharp points are liable to puncture the lung. When the aspirator trocar is withdrawn from its canula, the end of the mouth attached to the rubber tube should be rapidly inserted into the extremity of the canula, and the admission of air avoided; this should be done during an expiratory movement.

In using Dieulafoy's instrument in the ordinary way the negative pressure or suction force is very unequal at different stages of the tapping. When the piston is drawn to the very top of the cylinder, and the vacuum thus created is suddenly brought into connection with the column of fluid in the canula by the turning on of the stop-cock, the difference of pressures is so great as to suck shreds of fibrin into the canula which may block it up. The jerky way in which the fluid is thus pumped out is, moreover, liable to bring on paroxysms of coughing or dyspnœa. The writer after the first complete exhaustion of the cylinder (which should always be made prior to the insertion of the trocar and canula) finds it much better afterward to draw *slowly* up the piston as the fluid gradually flows into the cylinder. In this way a much more equable negative pressure is maintained than by the ordinary method of alternately making a complete vacuum, and causing a sudden rush of fluid with great force into the cylinder.

As much pus should be drawn off as can be got away without causing serious embarrassment, and the opening should be carefully closed with a pad of carbolic lint secured by strapping.

The method of treating empyema carried out by Bülau is safe, simple, and satisfactory as far as results go. He inserts a wide trocar and canula between two of the lower ribs, withdraws the trocar, and passes into the pleural cavity, through the canula, a full-sized rubber drainage-tube. This is fastened *in situ*, and connected by a bit of glass tubing with several feet of rubber tubing which is dropped into a vessel containing sublimate solution. As soon as the drainage-tube is lodged well into the pleural cavity, the canula is pulled over it and removed, and nothing left but the tubing. The contents are slowly and painlessly syphoned off without the danger of the admission of air, or the risk of pulmonary embarrassment being created.

Generally in a short time signs of reaccumulation show themselves, and in the absence of urgent symptoms the physician may try a second

tapping with the hope that the pus may not return. Though this hope must have little grounds in the case of adults, nevertheless in the case of children a complete cure sometimes follows the second tapping. When the fluid collects after the second aspiration a free incision must be determined upon.

If there be any evidence of "pointing," the site of the opening will be the point at which the bulging is most prominent. Marshall has shown that this is most frequently in the fifth interspace in front, external to the cartilages—a spot in which it is found that the thoracic parieties are the least protected; and this surgeon advises the opening to be made here whether pointing has occurred or not.

There is much difference of opinion among surgeons about the most suitable site for incision, and the matter is not of vital moment. The incision may be made in the sixth or seventh space in the axillary line, or in the eighth, ninth, or tenth space behind in the line of the angle of the scapula.

The most dependent part of the pleural sac will be the best to secure thorough drainage, but the lowest part of the sac may be already sealed up by the pleuritic inflammation, and should the surgeon make an incision into the tenth or eleventh intercostal space as advised by some he may find it impossible to enter the pleural sac.

Upon the whole the following will be found the most judicious line of action. The patient being under chloroform is placed upon his back, and very slightly rolled over upon the sound side.

Under the antiseptic spray an opening may be made in the sixth or seventh space large enough to admit a sound, which after its introduction is moved downward and backward until the posterior and lower limits of the pleural cavity are determined. At the most depending point of the sac the extremity of the sound is made to bulge out an intercostal space, over this the surgeon makes a clean, free incision a couple of inches in length into the pleural cavity, going through the thickened pleura close to the upper margin of the lower of the two ribs bounding the selected intercostal space so as to avoid the intercostal artery running along the lower margin of the uppermost rib. The centre of the incision may with advantage fall behind the line of the angle of the scapula. If it be found that the ribs are so close together as to leave too little room for the free exit of matter, the surgeon proceeds to remove a portion of the adjoining rib.

After the removal of the periosteum from the external surface for about two inches by a periosteum-elevator, this instrument is then insinuated between the bone and the periosteum on the internal aspect of the rib, and the rib is divided in two places by forceps or saw or chisel, and about one and one-half to two inches taken away. This will leave an aperture of sufficient magnitude for the free drainage of the cavity. The subsequent management of the case will vary according to circumstances.

Fagge in the case of children inserted the end of a fine rubber tube into the opening which he made so small as to cause the tube to be firmly grasped by the skin, the other end of this tube he carried beneath the surface of some carbolized liquid in a jar placed beneath the bed. The negative pressure of the column of liquid acting hydrostatically he found to gradually cause expansion of the compressed lung, and rapid cure often resulted. The results were identical with those obtained by the less formidable method of Bülau just mentioned.

When the second opening has been made as above described, and the pus evacuated, the upper opening is carefully closed. To insure thorough drainage and to keep the lower opening patent a stout drainage-tube is inserted, this tube should have a flange to prevent its slipping inside the cavity and being lost. Tubes are made of rubber, vulcanite, metal, or celluloid, and should be held in position by a large pad of carbolized tow or oakum. They may be removed and cleansed as often as required.

W. Williams has devised a valvular tube for removing the atmospheric pressure from the external surface of the lung while the chest-wall opening remains patent; this facilitates the expansion of the lungs, and is a distinct gain if experience proves that it can be easily worked.

Where the contents of the cavity become putrid, weak injections of Condy's fluid, carbolic or boric acids, bichloride of mercury, iodine, chlorine solution, quinine, or other antiseptics may be used. The sudden deaths that have followed the use of the mildest of these injections should make one pause before resorting to their use, and innumerable successes without irrigation show that ordinarily the washing out is not essential.

If the above treatment fails to relieve, and the pleural cavity continues to secret pus for months, and it becomes evident that delay in healing is owing to the failure of the lung to expand and the inability of the chest-wall to fall in and obliterate the space because of rigidity of the ribs, there is nothing open for the surgeon but to perform Estlander's operation and excise portions of several ribs. As much as four inches of the third, fourth, fifth, and sixth ribs with the thickened pleura attached to them may be removed, and the chest-wall permitted to fall in and obliterate the cavity, after which a cure may be expected.

It is hardly necessary to say that during this slow-healing process there must be the closest attention to the general health of the patient. Everything that improves nutrition, appetite, digestion, sleep, cough, etc., must be from time to time pressed into the service. Change of air, scene, and climate may be demanded.

Attention should be paid to the position of the patient's body, so as to secure the most thorough drainage; and at first he should be made to lie upon the affected side, so as to ensure that the opening will correspond to the most dependent point.

ENDOCARDITIS.

The treatment of this affection, which is so frequently a complication of acute rheumatism, is to a large extent also the treatment of the rheumatism. In the early stages of the fever much can be done to prevent the development of serious endocardial inflammation. Sibson pointed out the enormous importance of *absolute rest*. A study of the clinical reports of patients so treated showed that endocarditis occurred almost though not quite so frequently among them as those treated without rest. But it also showed that though endocarditis supervened, it was *much less* likely to be followed by permanent valvular mischief in those subjected to a thorough rest treatment.

These facts proves the great importance of ordering the rheumatic patient immediately to bed as soon as the symptoms of fever and joint trouble declare themselves.

Conflicting opinions prevail about the value of salicin or salicylates in preventing endocarditis. The writer has carefully watched the results of this treatment at the bedside, and has, as far as possible, kept an eye upon the patients afterward. His experience, though it does not lead him to believe that the salicylic acid treatment more than appreciably lessens the chance of endocarditis, nevertheless leads him to believe that it will be proved that a large proportion of the salicylic cases escape the more serious forms of valvular lesion.

The impurities so constantly found in the artificial acid may possibly tell against the results. (See under Rheumatism, Acute.)

Every means that will lessen cardiac activity and relieve pain must have some beneficial action in lessening the risks of cardiac complications, and must have some modifying action upon these complications when already established.

When the physical signs indicate that endocarditis has already supervened, the salicylic treatment, according to the great majority of observers, should be discontinued. The writer has, however, continued its administration in full doses where the pain and fever kept high. Recently-acquired knowledge will, however, lead him always to employ the *natural* or repurified acid under such circumstances.

In the absence of pain and fever, the salicylic treatment should always be stopped. Absolute rest must be still enforced, and the patient should not be permitted to even sit upright in bed. The nurse must insist upon the use of the bed-pan on all occasions.

In place of the salicylates the best treatment now is full doses of alkalies combined with opium. 20 grains of bicarbonate of potash, with 5 minims of laudanum, may be given every four hours. Should this line of treatment be pursued for any length of time, it will be well to substitute the sodium for the potassium salt, owing to the depressing effect of the latter upon the cardiac muscle. Quinine in large doses may be given when the temperature keeps high. At a later stage stimulants may be demanded. Should the case become grave, alcohol, ammonia, and digitalis may be given in combination, but only when

there is evidence of failure of the ventricle. Harm is decidedly done by the haphazard employment of large doses of digitalis the moment that any cardiac lesion is discovered. Moreover, it is of little use if the temperature is high. Rarely will the embarrassed condition of the right ventricle call for venesection, though the writer has seen marked relief follow the administration of a smart saline purgative in endocarditis. Aconite in small doses in the *early* stage is recommended, but it should be discontinued as soon as the pulse falls.

Local applications are of value in endocarditis when præcordial pain and distress are prominent. The application of a linseed poultice, upon which a little unguentum belladonnæ is smeared, is an effective remedy. The extract, rubbed up with glycerin, may be smeared over the cardiac area. The liniment alone, or mixed with chloroform liniment, and covered with oiled silk, or the belladonna plaster may be applied. Leeches may in rare cases be called for.

Often a small blister, kept in contact with the skin above the apex region for a period not exceeding three hours, gives relief to distressing sensations in this region, and quiets cardiac action if tumultuous. The writer has seen acute rheumatism in its earliest stages treated by Dr. Harkin, who applies a large blister over the cardiac region (quite independent of the absence or presence of cardiac complications). The result of this treatment, as regards the prevention or occurrence of cardiac complications, will be of great value; at present the number of cases is too small for basing any conclusions upon. The effect upon the heart, temperature, and pains, was always striking in those cases under the writer's notice.

Dr. Sansom thinks that vesication, by applying the callodium cum cantharide over the skin of the left axilla, is of service in endocarditis.

In the presence of symptoms suggestive of a thrombus having formed in the cardiac cavities, ammonia should be freely given in large doses by the mouth, and, if dyspnœa continue with serious symptoms, it may be given also by hypodermic injection. In the absence of urgency, grave symptoms may be combatted with the following combination of Bartholow's:

℞.—Ammonii carbonatis ʒij.
Liq. ammon. acetat. ℥vj.—M.

S.—A tablespoonful with a little water every six hours.

The after-treatment of endocarditis will be best carried out by a course of iodide of postassium in small doses, and, for a long time, rest must be enjoined. From what has been already said, it will be evident that an *early* return to active exercise or to busy life, will probably have a serious determining influence upon the nature and extent of the valvular lesion. Prolonged rest after apparent convalescence will give the patient the best possible chance of escaping without a permanent valve trouble. In the writer's experience, it is not rare to find systolic apex murmurs disappear at this period.

In *ulcerative* endocarditis, in addition to the above measures, hope of success seems to lie in the internal administration of large doses of antiseptics. Sansom strongly insists upon the continuous administration of the sulphocarbolate of sodium, in 30 grain doses three times a day, and, at the same time inunctions of carbolized oil (1 : 5) over the chest and back, morning and evening. He believes that the soda salt appears in the tissues as sulphate, the phenol being set free rendering the tissues antiseptic.

Success has followed the administration of large doses of quinine, and small doses of the bichloride of mercury.

Stimulants and, at a later stage, large doses of iron preparations, especially the tincture of the chloride, will be indicated.

ENDOMETRITIS.

Rest, in the horizontal position, must be insisted upon in the *acute* form of the disease. If the attack is the result of any septic mischief, caused by retained placenta, the accompanying metritis and peritonitis often present will call for remedies to relieve pain and reduce fever. Should there be evidence of any retained membranes, clots, or secretions, the uterus should be well washed out with weak sublimate solution. In the absence of such evidence, local injections in the early stages are mischievous. Poultices over the abdomen, or warm fomentations, should be constantly applied. The surface of the poultice may be smeared over with belladonna ointment. One large enema of tepid water should be employed to thoroughly empty the rectum, after which the bowels should be let alone. Purgatives at the early stage of the affection do more harm than good.

Pain should be relieved by morphine suppositories, and it is a good plan to give a little opium by the mouth at short intervals, say 2 grains of Dover's powder every two hours with $\frac{1}{2}$ grain of quinine. A dozen leeches may be applied round the anus in very severe cases.

After the more urgent symptoms have been combated by these means, hot sitz or hip baths may be frequently used.

Vaginal injections of large quantities of hot water while the patient is in the bath, or afterward, are very beneficial as soon as leucorrhœal discharge appears. Proper precautions must be taken to prevent the vaginal tube being passed into the uterine cavity.

Continuous flow by a can and syphon arrangement is better than the intermittent jetting of the ordinary rubber suction apparatus. The temperature of the fluid should begin at about 102° F. and be gradually raised to 108° F. About one gallon of fluid should be used at each sitting, and this may be repeated two or three times a day. A tablespoonful, or double this quantity, of pure carbolic acid may be thoroughly dissolved in the water.

After the discharge has been established for some days, saline purgatives are useful. If hemorrhage or menorrhagia appear, the best treatment will be hypodermic doses of ergotine. (See Metritis.)

In the treatment of the *chronic* form of the disease constitutional remedies hold a high position. There are few diseased conditions whose successful management entails such a severe tax upon the skill of the physician.

Rest, except immediately after some operative interference, does more harm than good, but moderate rest should be advised during or about the end of menstruation, and during the early period of pregnancy if the condition be not so advanced as to cause sterility.

Every measure calculated to improve the general health and nutrition of the patient must be insisted upon. A most minute and searching examination should be made into the habits, family and previous history and general condition of the sufferer before this can be decided upon. Any violation of a health law must be set right before local treatment is thought of. Errors in diet, resting or taking of exercise, evacuating the bowels, etc., may be easily set right. Constipation must be promptly and perseveringly treated. (See Constipation.) Appetite, if failing, should be aided by mineral acids with quinine. Strumous, syphilitic, or other dyscrasiæ can be met by appropriate remedies and sexual excesses prohibited.

A prolonged course of arsenic, iodide of potassium, or iron may be given with advantage after the more urgent or important symptoms have been combated, and these drugs can be given in short alternate courses with great benefit.

During the management of the case the physician will find himself called upon to relieve symptoms, and to prescribe temporary remedies until opportunity offers to strike at the root of the disease. Pain must be relieved when severe, and this should be done when possible without resorting to narcotics.

Hot water vaginal injections may be freely used, and these may be assisted by the hot sitz or hip bath. One or two gallons of water at a temperature of not less than 105° may be made to syphon continuously through the vagina, soothing local irritability and influencing the entire pelvic circulation most beneficially. In the intervals between the use of hot injections bromides are of much value in diminishing local sensibility, and their use may be kept up where narcotics would be objectionable. The dilute hydrobromic acid combined with sodium bromide and a small dose of quinine, is a good routine method of relieving the distressing sensations so commonly observed during the course of chronic endometritis.

For occasional use antipyrine (10 grains) or antifebrin (5 grains) often acts like a charm.

Opium, morphine, chloral, codeine, belladonna, hyoscyamus, alcohol, cannabis indica, conium, and other sedatives or narcotics may from time to time in emergencies be employed, but in a disease whose nature and duration is so essentially chronic, the habitual use of any of these potent remedies is to be strongly condemned. The least objectionable of them is a combination of belladonna and codeine with or without Indian hemp:

℞.—Ext. belladonnæ fol. gr. $\frac{2}{3}$.
Ext. cannabis ind. gr. $\frac{1}{3}$.
Codeinæ gr. $\frac{2}{3}$.—M.

S.—One pill four times a day, if in severe pain.

Any of the above may be given as a suppository or medicated pessary, and in this form are less objectionable than when administered by the mouth.

Edis recommends counter-irritation by a series of small blisters applied over the seat of pain, and relief may be often obtained by applying upon lint a mixture of equal parts of liniments of belladonna, aconite, and chloroform under oiled silk. Plasters of belladonna and opium may afford considerable comfort when worn over the back and loins, and over the lower part of the abdomen in front.

Local treatment will consist in first setting right any complication that may be found to exist, flexion or version should be corrected by proper pessaries. Cervical endometritis, when present should be dealt with by removing all discharge, slitting up the os if narrowed, and applying caustics to the cervical canal by means of a Playfair's probe, armed with a layer of absorbent wool.

Pure carbolic acid, iodized phenol (1 ounce iodine dissolved in 4 ounces strong carbolic acid) solution of nitrate of mercury, or chloride of iron, stick of caustic (nitrate of silver), strong nitric acid, chromic acid, or other escharotic may be used for this purpose. Granular cervix may be treated in the same way. If there be much congestion, engorgement, or inflammation of the lower part of the uterus, a surprising relief often follows the insertion of a large plug of absorbent cotton wool *saturated* with pure glycerin, and allowed to remain in the vagina for twenty-four or forty-eight hours.

Should the probe be found to pass easily up into the cavity of the uterus, and its lining membrane be found roughened and hypertrophied, and especially if the endometritis has been known to follow abortion, or to have had its origin in retained placenta, the curette or Simpson's uterine scoop may be used. In this way, after drawing down the uterus with a vulsellum, the curette is made to scrape the uterine walls from above downward, beginning with the anterior. After the removal of the *débris*, a probe, well covered with wool and dipped in pure carbolic acid, iodized phenol, or any of the caustic solutions just mentioned, should be used to swab out the interior of the uterus. The curetting, followed by caustic applications, is, no doubt, heroic treatment, and it is seldom that it has to be resorted to. The great majority of cases, even of long standing, will be sufficiently well met by swabbing out of the uterine cavity by caustics without previous curetting.

It is of great importance to remember that these operations should not be undertaken at a time close upon the menstrual period. The best time is about nine days after menstruation has ceased. As a

rule, one application, or, at the most, two, should only be made to the interior of the uterus every month, and rest for several days in bed should be insisted upon after each operation.

Many cases can be successfully treated by caustic applications confined to the cervical canal.

Recently Dumontpallier has reported the treatment of 100 cases without accident, and with 96 successes, by inserting a pencil of chloride of zinc up to the fundus of the uterus, and then leaving in a vaginal tampon, the slough caused by the caustic coming away in about seven days. After-treatment consisted in antiseptic douching, until the final separation of the slough.

Iodoform has been used successfully in the same way, and it is safer and more controllable.

The practice of injecting caustic solutions into the uterine cavity, or of passing up solid caustics and ointments, and allowing them to remain there, should only be followed out under very exceptional circumstance, and this treatment had better be left in the hands of specialists. Many deaths from peritonitis, caused by the injected matter travelling up the Fallopian tubes, have been recorded. In most instances, before swabbing out the uterus with caustics, it will be advisable to dilate the cervical canal rapidly, or by means of laminaria tents. The writer has had excellent results after such dilatation, and the application of strong nitric acid to the uterine cavity, as recommended by Atthill.

After the application of caustics in this way, it is advisable to insert a large vaginal tampon of wool soaked in glycerin, and administer $\frac{1}{2}$ grain of morphine as a suppository, and to keep the patient at rest in bed for several days. The caustic applications may require repetition at considerable intervals.

The subsequent administration of ergot—20 minims of the fluid extract, or 1 grain of ergotine, or 1 drachm of the fluid extract of ustilago maydis—will do much in restoring the uterus to its normal condition. (See Metritis.)

ENTERIC FEVER—See Typhoid Fever.

ENTERITIS.

The treatment of this affection, which can hardly be regarded as existing as a primary disease, will correspond to the management of a case of acute diarrhœa or dysentery. (See under Diarrhœa and Dysentery.) Where the condition is obviously secondary to some other affection, its treatment will be referred to under the head of the primary affection.

ENTROPION.

Entropion, or inversion of the eyelids, and *ectropion*, or eversion of the lids, may be considered under the one heading for convenience.

If the ectropion, or eversion of the lids, be depending upon a hypertrophied conjunctiva, the result of old inflammation, the excision of a longitudinal piece of the thickened membrane will bring the margin of the lid into its normal place. The solid stick of caustic, in mild cases, may also accomplish this. Any bands or adhesions of the skin to the margins of the orbit should be freely divided subcutaneously, after which it may be necessary to sew the lids together, until the healing process is complete, in order to prevent a recurrence of the eversion.

Plastic operations, with transplantation of the skin, may be necessary in bad cases. If the ectropion be caused by paralysis of the seventh nerve, ending in the loss of power in the orbicularis, treatment by hypodermic injections of strychnine may be useful. The canaliculus may require to be split in order to remedy the lachrymal overflow, and measures must be taken to prevent destructive inflammation of the exposed conjunctiva.

Entropion seldom fails to return after temporary strapping back of the inverted lid, even when the affection is simply owing to spasm. The best procedure is to pinch up a fold of skin close to the margin of the lid and snip it out with scissors, making the removed portion proportionable to the degree of inversion. At the same time, a small fold of the exposed orbicularis muscle should also be removed, and the marginal fibres of the orbicularis, at the external angle, may also be cut through. The wound will heal without sutures.

Where there is organic thickening, with much trichiasis, it will be necessary to dissect out a strip of tissue containing the lashes along the margin of the lid. This is done by splitting the lid in the first instance, and making an incision about one-twelfth of an inch from the margin of the lid, along its entire length. The strip removed should contain the cartilage and hair follicles.

Bürow's operation consists in making an incision from the conjunctival surface along the entire length of the lid, and close to its margin.

Arlt's operation is performed by deeply splitting the lid in its entire length, and removing a semicircular flap of skin along its margin, after which the edges of the wound are sutured. This tilts forward the margin of the lid containing the lashes.

Other operators, as Streatfield and Wells, remove a wedge-shaped piece of the tarsal cartilage in order to secure more complete eversion of the margin of the lid.

Van Milligen's operation consists in splitting the lid, by a free incision in the intermarginal space, for its whole extent. The gap thus formed is kept open by sutures passed through the skin of the upper lid. A linear strip of mucous membrane is then dissected off the internal aspect of the lower lid, and adjusted into the hiatus caused by the splitting incision.

ENURESIS—See Incontinence of Urine.

EPIDIDYMITIS—See Orchitis.

EPILEPSY.

The treatment of this affection will embrace the management of the patient (1) during an attack, (2) immediately before an attack, and (3) in the intervals between the attacks.

If the physician should chance to see the patient when the seizure is taking place, he will find that, beyond attention to a few details, his position must be one of "masterly inactivity."

The instant removal of all constrictions about the neck or throat should be seen to, and the patient should be placed flat upon his back if he has not already naturally assumed this position. A soft pillow may be placed under his head, and attention given to the state of his mouth. If the tongue protrudes, a large cork or piece of rubber tubing may be inserted between the teeth to prevent its being injured. Any artificial teeth or food should, if possible, be removed from the mouth.

It is useless to make attempts to restrain the movements by forcibly holding down the convulsed limbs; all that can be done is to watch and see that the patient inflicts no injury upon himself during the clonic spasms. There are, however, some measures which may prove useful during a severe epileptic seizure.

Pressure over the carotid artery upon each side, by thrusting the thumbs deeply against the skin at the root of the neck, and making firm pressure backward, compressing the tissues very firmly between the thumbs and the spine, often cuts short the attack. It was supposed that by so doing, the amount of blood going to the brain was suddenly lessened, but the effort produced upon the convulsions is more probably caused by the influence of the pressure upon the cervical sympathetic, and vagus nerves. This manœuvre is sometimes also tried to prevent an attack which is threatening.

Inhalation of the vapor of nitrite of amyl often modifies the attack in a marked degree; 5 minim capsules may be broken, and the vapor inhaled through the nose. This may be repeated every thirty minutes in those cases where the coma lasts long after the convulsions have ceased.

The treatment in the intervals between the attacks has been very varied in the hands of different authorities, but there is no remedy equal in its effects to large doses of bromine salts. This should be the method employed first in every case of epilepsy, even where only one attack has taken place, as experience proves that the first fit of epilepsy, or of *petit mal*, the bromide should be given at once, and persistently continued for many months, if the seizures recur. The treatment may be continued with very short periods of rest, for years. If no second attack happens the patient may be permitted to leave off in twelve months, having previously from the end of the first six months limited himself to one large dose at bed-time.

Different opinions prevail about the relative values of the different bromides. The potassium salt is the favorite, and may be given in doses of 20 to 30 grains three times a day after meals for a long time. The ammonium and sodium bromides may be given in similar doses. It is often to be found that the symptoms of bromism which supervene after the potassium salt has been given for some time may be caused to disappear or lessen by substituting the sodium preparation for a time. The potassium base has a very depressing effect upon the muscular and cardiac apparatus, and should not be ordered in large doses for indefinite periods. It will be found wise to discontinue the use of all bromides for a few days when severe headache, loss of appetite, great muscular weakness, malaise, and impairment of sensations in various regions appears. In returning to treatment again, the writer begins with the dilute hydrobromic acid in 30-minim doses, freely diluted, three times a day. It is a good plan to keep the patient for one month at a time upon 20 grains of a bromide salt, changing it to another at the end of this period. Thus, in turn, the bromide of potassium, bromide of sodium, bromide of ammonium, and hydrobromic acid may be administered for four months. It is a very difficult point to determine which one of these salts is the most valuable in any given case. The writer believes that he has seen better results from the bromide of ammonium when given in the cases of children and very young adults. Some authorities prefer the ammonium salt to the other bromides in *petit mal*. In nocturnal epilepsy one large dose should be given at bed-time.

Brown-Séquard insists upon a mixture of the bromides as giving much better results than any one singly. The following is his favorite combination given *before* meals, while *after* meals a tonic is ordered consisting of either strychnine or arsenic with a vegetable bitter:

℞.—Potassii iodidi ℥ij.
Potassii bromidi ℈j.
Ammonii bromidi ℥iij.
Potassii bicarbonatis ℥j.
Tinct. calumbæ ℈j.
Aquæ destil. ℈vj.—M.

S.—A teaspoonful before meals three times a day, and three teaspoonfuls at bed-time, in water.

Where *petit mal* is present, he advises the ammonium salt to be increased and the potassium salt diminished. The same authority states that patients have taken the above combination for eight or ten years without harm.

There is no practical guide to the amount of bromides which an epileptic can tolerate without inconvenience. Children bear large doses (2 or 3 drachms in the day) sometimes, while many adults

cannot long endure more than 100 grains daily. The great secret of success in treating epilepsy by these drugs depends upon regularity and perseverance in the dose. Chloral added to the bromide enables the physician to diminish the large doses, and as Seguin has shown, the dose should be *largely* diluted with plain water or an alkaline liquid like Vichy.

This treatment should be persevered in for two years after the last attack, and should, if possible, not be interrupted even for a single day. Mono-bromide of camphor in 5-grain doses has been recommended as a substitute for the ordinary bromides.

The acne produced by large doses of the bromine salts is prevented or modified by combining arsenic with them; rarely does the anæsthesia of the palate and pharynx give any trouble, This should be always induced when possible, as a guide is thus obtained that the full effects of the drug are produced.

The bromine treatment will be found to fail completely in a variable percentage of cases. In our present ignorance there is no method by which such cases can be recognized until the drug is tried. Probably such examples of the disease will be found to belong to a separate group, with totally different causation and pathology. Where a sufficient trial proves the failure of the bromides, the next remedy worthy of a trial is belladonna or atropine. Trousseau got good results from this drug when used over periods of one or two years. The *green* extract of belladonna may be commenced in doses of $\frac{1}{4}$ grain in pills, given three times a day, and this dose may be increased to $1\frac{1}{2}$ grains; 15 minims of the U. S. P. tincture may be given, or 2 to 4 minims of the solution of the sulphate of atropine (1 : 100) may be administered three times a day. Of the alcoholic extract of belladonna root not more than $\frac{1}{6}$ grain should be given at the commencement of the treatment; 10-minim doses of the succus, increased to 30 minims, may be tried.

When belladonna also fails, the following list may be tried in the order in which the remedies are named: salts of copper, silver, zinc, gold, arsenic, phosphorus, cerium, nickel, lithium, osmium, boron, sodium, and nitrites.

Of the copper salts, the ammonio-sulphate is the one recommended by Brown-Séquard; $\frac{1}{4}$ grain in pill three times a day will be a fair dose to begin with. It should not be continued beyond three or four months at a time.

Silver salts have produced very good results in both forms of epilepsy, but serious permanent staining of the skin has so often followed their administration that they must be given with caution, and on no account should their administration be continued for a longer period than eight weeks, and even then some discoloration may be produced. The nitrate in doses of $\frac{1}{4}$ grain, or the oxide in doses of 1 grain, may be given three times a day in pills.

Zinc salts have been much used in the treatment of epilepsy, and

their administration is not attended with the serious drawbacks attending the use of silver or copper compounds. The bromide of zinc may be given in doses of 5 grains, in water and glycerin, four times a day. It may be combined with other bromides. The oxide in doses of 10 grains, the sulphate (6 grains), the acetate (4 grains), the valerianate (4 grains), the phosphide ($\frac{1}{25}$ grain), may be given in the pilular form for long periods. The oxide has especial advantages in epilepsy occurring in children, and the valerianate in cases associated with hysteria. The action of the sulphate is the least satisfactory of the list.

The chloride of gold and sodium has been used as a substitute for the silver salts. Though there is not enough experience of its action to warrant a decided opinion upon its merits, nevertheless its results in hystero-epilepsy warrant a trial of it in epilepsy where other agents have failed. In doses of $\frac{1}{15}$ grain, in pills, it may be given for long periods without harm. The writer believes it to be one of the most valuable drugs in the treatment of epilepsy associated with organic nerve lesions. Bromide of gold is recommended by some authorities.

Arsenic has been much praised in epilepsy, but it is very doubtful if any really *permanent* benefit has followed its use. The writer has seen marked temporary advantages follow its prolonged administration in *petit mal*, where the bromides failed after long trial, in children. It is, moreover, an excellent tonic to give with the bromides; and not only does it modify or prevent the acne which they produce, but it appears to lessen the risk of bromism when the bromine treatment is continued for very long periods. There does not appear to be any advantage in increasing the dose beyond 4 minims of Fowler's solution.

Phosphorus has been used and extolled, but much of the good results obtained from its administration may be fairly attributed to the cod-liver oil with which it has been often combined when ordered as a remedy in epilepsy. It may, however, be useful when a strict vegetarian diet has been persevered with for a long time.

Salts of cerium (3 grains of the oxalate), of nickel (1 grain of the bromide in pill or syrup), or of lithium (30 grains of the bromide in gouty subjects), have been given with varying success. The latter salt acts like the other bromides.

Osmic acid, which has been extensively used in obstinate sciatica, has been administered recently in epilepsy in doses of 2 minims of a 1 per cent. solution. Wildermuth gave in intractable cases fifteen pills daily, each containing $\frac{1}{64}$ grain of osmate of potassium, with benefit in several cases.

Borax, in doses of 20 grains three or four times a day, has within recent years been stated to have produced very good results in epilepsy, but many reliable reporters state that they have seen nothing but furred tongues and gastric irritability follow its adminis-

tration. It is stated that it has most influence over nocturnal epilepsy.

Chloride of sodium, in doses of 1 to 2 drachms, has been followed by some remarkable successes in the hands of Nothnagel and others.

Nitrites possess unquestionable power over epilepsy, but unfortunately their effects are, as a rule, temporary. Thus, nitrite of amyl, as already mentioned, will shorten the status epilepticus, will cut short the convulsions, or will prevent the seizure, in many cases completely, if inhaled in time, as soon as an aura is experienced.

Similar effects may be produced by nitro-glycerin, in doses of 2 minims of a 1 per cent. solution, and the effects are more lasting. The writer has described upon page 44 the method by which he obtains all the valuable properties of this drug in the treatment of angina pectoris, and he believes that similar benefits might be obtained in the prevention of epileptic attacks if administered in the same way, though he has not tried the drug in the disease under consideration. It probably will be found of great value if so prescribed in *petit mal.*

The nitrite of sodium has been given with benefit in *petit mal*, in doses of 1 grain four times a day in solution. In bad cases, if each dose were diluted and swallowed at about six or eight times, with intervals of about fifteen minutes, it is probable that the fits might be warded off for an indefinite period. Nitrites of sodium and potassium have been used in the *petit mal* of children with some success.

Where syphilis has been known to exist in a patient the subject of epilepsy, there should be no hesitation in beginning with small doses of the bichloride or biniodide of mercury. Afterward large doses of iodide of sodium (30 grains), three times a day, may be given.

Amylene hydrate has been much praised by Wildermuth, in doses of 30 grains thrice daily.

Chloral hydrate has been given to prevent or modify the seizures, but in the writer's opinion this is a very doubtful procedure in most cases. He has, however, availed himself of its anti-spasmodic powers in infantile convulsions, probably of an epileptic nature, and, as just stated, it is occasionally of great use in permitting the physician to diminish the amount of the bromides for a time when these disagree.

Antipyrine and antifebrin have been tried in numerous instances, and have been proved to possess little beneficial influence in epilepsy, except when given in very large doses, and even then the results are often very evanescent, and are sometimes followed by more violent attacks when the action of the remedy passes off.

Recently Wood has given strong reasons for believing that a combination of bromide of ammonium and antipyrine will give better results than are to be obtained from either remedy separately, and Potts has published a striking report of forty-three cases treated by

this combination, the dose being 6 grains of antipyrine and 20 grains of the bromide three times a day.

Paraldehyde has been used with some success in place of bromides by H. B. Williams. Its effects soon pass off, however. Of vegetable substances vaunted for the cure of epilepsy, there is practically no end. Some are, no doubt, valuable adjuncts to the treatment by the metals and their salts, but the great bulk of the list may be safely left aside. Belladonna and atropine have been already mentioned, and strychnine in small doses is occasionally useful.

Camphor, lobelia, musk, asafœtida, bryonia, cocculus indicus, or its active principle (picrotoxine), conium, digitalis, santonin, rue, sumbul, ignatia, valerian, turpentine, cannabis indica, cypripedium, galium aparine, calabar bean, ergot or sclerotinic acid, simulo, cocaine, apomorphine, caffeine, codeine, curara, have all had their advocates.

The above is but a portion of the list of remedies, the glowing accounts of which, in epilepsy and other allied conditions, help to swell the current literature of therapeutics from year to year. Scarcely a single member of the list possesses any anti-epileptic virtues, and the use of many of them is fraught with serious danger.

While still dwelling upon the treatment of epilepsy during the intervals between the attacks, there are some methods not yet mentioned which have proved to be worth trial.

Electricity has been used in various ways. A continuous current may be passed through the brain from the occiput to the forehead (about five Leclanché elements). Three times as many cells may be used to the spinal column. Static electricity promises to give better results than the continuous current. General electrization with sparks from the spine may be tried.

Considerable diminution in the severity and frequency of the attacks has been reported, after several weeks' application of a weak continuous current to the thyroid gland.

Hypnotism has been mentioned by Liébeault, who advises the patient to be hypnotized between the attacks, and when in the somnambulistic state, suggestions should be made to him that he will not suffer from further attacks. The good results that sometimes follow the interference of so-called "faith-healers" prove the mysterious influence of the imagination in epilepsy, and would justify one in hoping that, when hypnotism is taken out of the hands of quacks and impostors, and scientifically applied in the treatment of disease, benefits may be obtained thereby.

Ligature of the vertebral or carotid arteries has been recommended and carried into practice, but with results that do not at present warrant a repetition of such formidable operations.

Counter-irritation, by means of blisters, and the actual cautery applied to the back of the head and neck, has been found to produce benefits of no mean value in epilepsy. A seton introduced into the

nape of the neck has been followed by cessation of the attacks for a long time.

Ice to the upper part of the spine, and counter-irritants, like croton oil, to the scalp, have been used successfully by Brown-Séquard.

Diet, though mentioned last, is one of the most important elements in the treatment of epilepsy. The writer has treated several cases of the disease by this means alone, and generally found very marked diminution in the frequency and severity of the attacks after putting the patient upon a purely vegetarian diet. He would, therefore, say that, given a case of epilepsy, the first thing to do before administering drugs is to forbid animal food entirely. After a little, when under the influence of bromides, milk, eggs, and fish may be permitted. It is remarkable that many epileptics, who protest against vegetarian diet at the beginning, can scarcely be tempted to return to animal food after several months trial of this practice.

For the prevention of attacks in those cases where a warning or well-marked aura is experienced, much may often be done. Tying a ligature tightly around the limb where the aura is felt, or irritating the region by pinching, pricking, or galvanism, may put off the seizure.

Where contractions of muscles warn the patient that an attack is coming on, prompt forcible extension of the contracted limb often wards off the convulsions. Thus, if the head, forearm, fingers, or leg are bent before the attack comes on, a forcible straightening out at once often nips the seizure in the bud. Pressure upon the carotids at this stage may be equally efficacious. Nitrite of amyl, in many cases, if inhaled immediately after the warning, postpones the attack, or, as already mentioned, modifies the convulsions if already started.

Chloroform or ether inhalations may also ward off convulsions if employed when the aura is felt. Many other means have been discovered and resorted to by patients who experience warnings, thus: violent breathing, shouting, jumping, electric shocks, ammonia, or pungent snuff have been utilized by patients who have found their employment to cause postponement of the attack. Counter-irritation to the spot in which the aura is felt, or blistering of the limb above the spot, sometimes prevents further attacks. If any portion of the body is discovered upon which pressure or irritation causes an attack to come on, Brown-Séquard advises counter-irritation to be applied to this region.

Little need be said regarding the remarkable results alleged to have followed operative and other treatments of ocular and nasal disturbances supposed to be the cause of epilepsy. With very rare exceptions these have proved delusive. In cases of localized epileptic convulsions, where all the characters of an epileptic attack may be observed with a motor aura confined to one limb or one group of muscles, the lesion in the brain may be localized with accuracy in some cases.

Trephining has given brilliant results in such instances where the symptoms of compression or irritation warranted the opening of the cranial cavity.

Victor Horsley has published some remarkable results upon the operative treatment of *focal* epilepsy. After a few months unsuccessful treatment by bromides, counter-irritation, etc., and repeated observations with the view of localizing the seat of the epileptogenous disturbance, he explores the spot by trephining; if no gross lesion is observable upon exposure of the cortex, he stimulates it with an induced current, and excises the spot giving rise to the initial spasm. His invaluable paper, to which the reader is referred, appears in the *British Medical Journal*, December 6, 1890.

EPIPHORA.

The cause must be treated when this is possible. If a stricture of the nasal duct be present it must be permanently dilated. This may be accomplished by passing a probe down at repeated intervals through the narrowed duct; to cause wide dilatation the probe may be kept *in situ* for a short time. Astringent solutions may be injected after a very large probe has been made to enter.

Should there be much difficulty in passing the probe, either canaliculus may be slit up for a portion of its extent. This is best done by inserting through either punctum a fine grooved director into the sac along the canaliculus, and slitting up the canal in part or in its entire length. After this any form of probe, medicated bougie, tent, or style, may be employed to keep up dilatation.

Stilling, Weber, and others overcome the obstruction by incisions made with variously shaped knives, and the actual cautery and the galvano-cautery have been used with advantage to cause obliteration of the entire lachrymal sac, after milder measures have failed.

Extirpation of the lachrymal gland has been practised.

EPISPADIAS

is generally associated with ectopia vesicæ, and the only treatment of any service is a plastic operation, performed by dissecting a flap from the abdominal surface and two flaps from the groins, with a view to cover in the exposed bladder region. After the cicatrization of these flaps, another plastic operation, as devised by Nélaton, may be undertaken to remedy the epispadias.

EPISTAXIS

should only be stopped when the bleeding occurs under such conditions as warrant interference. In plethoric subjects, and in those suffering from congestive headaches, the discharge gives relief, and measures for its arrest should not be undertaken unless when the flow has already been plentiful.

By placing the patient upon his back, with the shoulders and head moderately elevated and the arms raised as high as possible above the head, while pressure is made upon the bleeding nostril, most cases will

speedily stop. Should this fail, cold compresses of ice to the temples and occiput, and sinapisms to the calves of the legs, may be tried. The reflex action following these applications often speedily causes closure of the bleeding vessels, through the vasomotor supply. Hot foot baths and hot water bags to the spine may be useful.

When these measures fail, astringent lotions may be applied upon plugs of cotton wool or lint, which should be gently pushed up the bleeding nostril with forceps. In this way tincture of iron or the strong liquor (1 : 2), spirit of turpentine, concentrated solutions of alum or tannin, styptic colloid, etc., may be used. The writer's method is however, much better, and he has seldom failed by it in arresting copious hemorrhage, even when this has been the direct result of injury, as in removing polypi, etc. It consists in drying out the cavity of the nostril with plugs of absorbent wool, and rapidly inserting small masses of the puff-ball (*licoperdon giganteum*) until the nostril is comfortably distended with the fungus. (See fifth edition of the author's *Materia Medica and Therapeutics*, page 581.) The plugs of this substance may be left *in situ*. They come away in a few days if left to themselves.

India-rubber collapsible bags are made, and can be obtained from any instrument maker; after being inserted they are blown up with air, and can be made to exert a uniform, firm pressure upon every recess in the nasal chamber. They are cleanly and effective. The writer has, however, discarded them for the puff-ball, because the inflated bag, with its dependent tubing and stop-cock, is, as a rule, so unsightly, as to prevent the patient, for the time, pursuing his ordinary avocation. Should the hemorrhage be far back, one of these bags may be inserted through the mouth, and, after inflation, it can be pulled forward by means of its attached tube brought out through the anterior nares.

By means of the nasal douche, a stream of astringent solution may be made to pass through the nasal cavity and out of the opposite nostril, if the palate be elevated by keeping the mouth wide open. Fresh lemon-juice is highly recommended as an injection. *Hot* water may be so employed with great advantage, as in post-partum hemorrhage. Astringent powders may be blown in by the insufflator. Ergot and other hæmostatics, by the mouth or hypodermically, are generally useless. The writer has never seen them do any good, but they may be tried.

Should all these measures fail, there will be no resource left to the surgeon but to plug the nostrils (with a roll of lint) from the posterior nares. This is one of the simplest and least painful of operations in the eyes of the surgeon—until he has tried it. Having once performed it, he will hesitate to repeat or recommend it. It should never be undertaken unless the loss of blood is serious. By means of a Bellocq's canula, a thin double whipcord or hempen ligature is passed through the nostril, and one end brought out through the mouth. To this end compact roll of lint, large enough to block the posterior nares is

attached. Traction upon the cord in the nostril hauls the lint tightly against or into the aperture of the posterior nares, where it is held in position by a plug of lint packed into the nostril in front. Over this plug the ends of the cord may be tied so as to render displacement impossible. It is advisable to leave a piece of string attached to the plug behind; this may be left hanging in the pharynx, or it may be left projecting from the mouth. By pulling upon it, the posterior plug can be removed at any time through the mouth without difficulty.

Greville MacDonald finds that the erosion or venous rupture which causes epistaxis, is almost invariably situated upon the anterior portion of the septum, and can be reached by a speculum and good light, when the galvano or other cautery may be brought to bear upon it with definite results, or a small anterior plug may be inserted. Every surgeon will agree with him, when he states that posterior plugging is never necessary except in rare cases of post-nasal hemorrhage.

Where death threatens from loss of blood, transfusion should be performed. (See under Anæmia, page 36.)

EPULIS.

Unless the portion of the alveolar process from which the growth springs be entirely removed, the tumor is almost certain to return. A tooth upon each side of the epalis having been extracted, the limits of the incision in the gum may be marked out by two vertical cuts made by a fine saw. Between these points the growth and adjacent alveolus is cut out by sharp pliers. The actual or galvano-cautery may be used when the epulis is small.

ERYSIPELAS.

The treatment of this affection will embrace (1) *constitutional* and (2) *local* measures.

Everything tending to depress the vitality of the patient must be avoided. Bleeding, leeching, and profuse purging—favorite methods of treating erysipelas in times past—are always contra-indicated. A diet of the most sustaining and easily digested food should be given, solid meats being forbidden till fever disappears. A liberal allowance of good soup, beef tea, or chicken jelly, with milk in large quantity is essential.

In severe cases, alcoholic stimulants are always indicated. It is a mistake to give stimulants alone; when possible, they should be incorporated with the food. Thus, whiskey or good brandy may be mixed with the milk (one wineglassful to each pint or quart); and port wine (one wineglassful to each pint of beef-tea) may be given almost *ad libitum*. The writer has seen harmful results follow the injudicious order to give unlimited alcohol in severe cases. Sometimes the patient takes the stimulant to the exclusion of food; this is sure to lead to serious trouble. This is got over by laying down the rule that the

stimulant is to be mixed with the food. The previous habits of the patient, the stage at which the disease is found when the case comes under the physician's notice, the condition of the heart and vessels and the amount of cutaneous surface involved, and the temperature, will give valuable aid in arriving at a conclusion about the amount of alcoholic stimulants necessary. As a rule, *very* large amounts are well borne, especially in erysipelas following operations in intemperate or irregularly-living subjects. Mild cases will require no stimulants; they do better without them.

Before commencing medicinal treatment, one smart saline purge should be administered in order to thoroughly empty the intestinal canal. A mercurial may be given eight hours before the saline if the patient be robust, but it should not be repeated. 1 ounce Rochelle or 4 drachms of Epsom salt may be given in a tumblerful of lemonade.

Of the various drugs recommended from time to time for internal administration there are but a few deserving of confidence. These are in the order of merit: iron, quinine or bark, aconite and sulpho-carbolates or salicylates, and jaborandi.

Iron, to be of any use, must be given in large doses—30 to 60 minims of the tincture every two, three or four hours, according to the extent of local mischief or in proportion to the severity of the constitutional symptoms. The writer has seen it often do good and cut short the affection, but he has sometimes found it to fail completely. If there be high temperature, with great prostration, from the beginning, the iron treatment must be reinforced with quinine or tincture of cinchona. The best results will not be obtained by combining these drugs before administration. Though it is difficult to explain, the writer believes that by giving 40 minims of the tincture of iron every six hours, alternating with doses of 4 or 5 grains of quinine every six hours—*i. e.*, a dose of either drug every three hours—the effect will be better than if given together.

Should there be evidence of cardiac failure early in the disease, it is unwise to press iron; then teaspoonful doses of the tincture of yellow bark, mixed with an equal amount of aromatic spirit of ammonia, and a half ounce of brandy every two hours may be given, well diluted with water.

Aconite is extolled. It may be given advantageously where at the very beginning there is high temperature, a dry skin and tongue, with a bounding pulse in strong subjects. The dose should be small and should be repeated every hour, and the remedy should not be continued after the end of the second day unless there be a fresh invasion of other regions. Tison recommends that the crystallized aconitia be administered. The symptoms rapidly yield to this method of using the drug, and mild cases quickly get well. Such patients generally recover rapidly in any case, and it is doubtful if real permanent benefit follows the routine administration of aconite in erysipelas.

Tartar emetic acts in the same way, if given very frequently in minute doses.

Sulphocarbolate of sodium, in doses of 25 or 30 grains, given every six or eight hours, sometimes succeeds where all these remedies fail, especially where there is diffuse cellular inflammation.

Boric acid might act better in 10 to 15 grain doses, or benzoate of soda in doses of 30 to 40 grains every six hours.

Belladonna has been recommended; it may be given with ammonia or digitalis should the circulation be much depressed. Pilocarpine hypodermically ($\frac{1}{5}$ grain) has been recommended in idiopathic erysipelas and many very favorable reports of its value have been received during the last few years.

As regards the real use of internal remedies in erysipelas, the way is being cleared up greatly by recent pathological discoveries. It is clearly demonstrated that the disease is caused by the presence of a parasite, and hence the prevailing opinion that internal treatment can only be of use in correcting the poisonous effects of certain ptomaines or albumoses secreted by the streptococcus. This view does not entirely meet the case; it is clear that phagocytosis plays a very important part in recovery, and remedies like iron and quinine probably assist the phagocytes in their work of destruction. The pathology of the disease proves the importance and necessity of local antiseptic treatment.

The local treatment of covering the inflamed surface with some harmless or inert substance, to exclude the air and protect the part from variations of temperature, has been practised from the earliest periods.

Of the innumerable methods from time to time suggested, the most popular is that of sprinkling dry flour or powdered starch over the affected part till a thick layer lies evenly upon its surface. This may be achieved by using a common flour dredger.

White lead paint has been successfully employed; it is less likely to be brushed off by friction, and it keeps out the air and is thus supposed to rob the erysipelas cocci of the oxygen necessary for their growth and multiplication. Hewson uses an earth-dressing consisting of clay and water. Various other paints are used with the same intention—collodion, traumaticine, or the U. S. P. solution of gutta-percha, carbolic oil (1 : 8). Belladonna and glycerin ointments are also useful by excluding air and preventing the growth of the parasite. The best results are obtained by smearing the part freely over with a mixture of lanoline and ichthyol in equal parts, and then enveloping it in salicylated cotton-wool as practised by Nussbaum. He states that it is seldom necessary to continue this treatment beyond three days, as pain, redness, and itching disappear rapidly after the first application. An ointment of sulphate of iron (1 drachm) and lard (2 ounces) is also a very good preparation. Duckworth uses an ointment composed of equal weights of prepared or precipitated chalk and lard, to which 6

per cent. carbolic acid is added, and covers the part with boric lint. There are several means by which a local attempt may be made to prevent the disease from spreading. Higginbotham's "ectrotic" method consists in painting a strong solution of nitrate of silver (1 drachm to 1 ounce) upon the healthy skin around the margin of the diseased spot. The solid stick may be used after moistening the skin with distilled water. The writer has often observed striking results follow the application of liniment of iodine when used in this way.

Many surgeons now treat the disease by limiting its margins by the application of strips of adhesive plaster, which by their pressure prevent the spread of the parasite along the underlying compressed lymphatics, while others use the pressure of rubber or elastic bands for the same purpose. Both these plans are uncertain in their results.

Bromine solution may be used to surround the diseased area, and some surgeons apply it also over the affected surface. Collodion may be painted in a ring around the diseased spot. Carbolic acid (2 per cent. to 30 per cent.) may be injected with a hypodermic needle into the subcutaneous tissue around the affected region. Salicylic acid (concentrated solution) is used in the same way by Petersen, and Wilde uses sulphocarbolate of sodium solution (8 per cent.). Resorcin (5 per cent.) has been also injected.

These injections are doubtless highly efficacious, but they are painful, and not entirely free from danger, and the great majority of cases will certainly yield to ointments. The recent plan of making several small incisions around the diseased spot with a knife or vaccination comb, and then applying antiseptic solutions, is most certainly curative, but most painful.

Professor Koch's great remedy is creolin. He uses the following combination, and covers it over with oiled silk, and believes that decomposition occurs, iodine being set free:

℞.—Creolini		℥j.
Iodoformi		℥iv.
Lanolini		℥x.—M.

S.—To be smeared over the skin or applied upon lint to the diseased spot and beyond its margins, and then to be covered with oiled silk.

Creasote, made into a paste with kaoline, is smeared over the diseased surface by Marshall. Valette applies a 30 per cent. solution of chloride of iron. Dewer uses a mixture of equal parts of glycerin and sulphurous acid. Shoemaker recommends the ointment of oleate of bismuth. Rosenbach gets best results from the constant painting of the diseased surface with a 5 per cent. solution of carbolic acid in rectified spirit. Turpetine, picric acid (10 grains to 1 ounce), sulphate of iron (1 : 100), tincture of iodine, nitrate of silver (1 : 10), boric acid (concentrated solution), bichloride of mercury (1 : 1000) infusion of digitalis, permanganate of potassium (1 grain to 1 ounce),

have been used. As a rule, lotions are unsuitable in erysipelas where the skin is unbroken. Dry heat is essential, variations of heat and cold are certainly to be avoided, and poultices are, generally speaking, very harmful, unless to relieve the tension caused by the suppurative process.

In the great majority of mild cases, the best treatment will be to cover over the surface with flour, mixed with half its weight of boric acid, apply a thick pad of absorbent wool, and elevate the part affected. Seldom will there be any necessity for using a single member of the above formidable host of remedies. In erysipelas of the head and face, there is much incovenience caused by the usual mask of lint, with flour and boric acid underneath; the ointment, composed of equal parts of ichthyol and lanoline, leaves nothing whatever to be desired in such cases. It may be freely smeared on the face and scalp several times a day. Ichthyolized collodion is a splendid application in such cases.

Pain and smarting may be relieved by smearing over the part with a paint composed of 1 ounce of extract of belladonna, rubbed up with 4 ounces of glycerin, when these symptoms have not yielded to the ichthyol ointment.

The cellulo-cutaneous and diffuse cellular erysipelas are to be treated in the same way. Stimulants and nutritious concentrated liquid nourishment and free ventilation must be insisted upon. The local treatment, as described, should be carried out, and, as soon as tension is observed, hot charcoal poultices and free incisions may be resorted to, after which the suppurating wound may be treated with weak lotion of corrosive sublimate.

ERYTHEMA.

Under this heading are included by most writers a variety of affections. Their differentiation is not, however, a matter of much importance, as they mostly tend to get well if left alone, and their treatment, therefore, is comparatively simple.

The cause of the erythema should be found out, and remedied, when possible. This is essential in chronic or oft-recurring attacks.

Dyspepsia and gastric catarrhal conditions are answerable for many of these cases, and the state of the stomach and its digestive powers must be carefully remedied by appropriate treatment. (See under Dyspepsia.)

The erythema so common after eating shell-fish, pork, salt meats, etc., and commonly called urticaria, is generally found to cease after the offending article of food is discovered and discontinued. The urticaria or erythema following the administration of iodide of potassium, cubebs, copaiba, or turpentine soon ceases when these drugs are stopped. Should the affection appear without obvious cause, alkalies, combined with bitter tonics, may be tried first. Thirty grain doses of

bicarbonate of soda or potash, with 10 grains of carbonate of bismuth, in half an ounce of infusion of chiretta, is an excellent combination. The writer's favorite mixture in such cases is the following:

℞.—Liq. magnesii carbon. B. P. (fluid magnesia) . . ℥x.
Tinct. rhei ℥jss.
Glycerini purif. ℥ss.—M.

S.—Take a large spoonful three times a day, two hours after meals.

If this be insufficient to cause mild purgation, one dose (2 to 4 drachms) of sulphate of magnesia should also be given each morning, in a tumblerful of potash water.

Small doses of tartarized antimony seem to exert some specific action upon erythema or chronic urticaria, and cases are occasionally met with where this agent relieves, after all other plans, both internal and local, have failed. Two grains may be added to the above mixture.

While the stomach, liver, renal, or other affections are being treated by appropriate remedies, the local treatment of the case should be attended to.

Itching may be relieved by lotions of alkalies or of lead when the affection is local, and by tepid baths of bicarbonate or carbonate of soda (½ pound to 20 gallons) if the general surface is involved. Where warm or tepid baths aggravate, great comfort may be obtained by sponging over the body piecemeal with solution of bicarbonate of soda (1 ounce to 40 ounces of water). Cloths moistened with such solution may be allowed to remain in contact with the itching part. A good lotion, when the soda solution fails, is one composed of 1 ounce of strong solution of subacetate of lead in 3 pints of distilled or rain water. To this half a pint of spirit of wine may be added. Borax (1 ounce to 3 pints of water) may be useful when this fails.

Hydrocyanic acid (1 drachm, to water 15 ounces) may be used upon lint, and covered with oiled silk.

Evaporating lotions often give relief, when bathing, sponging, and other means fail.

The following may be applied with a brush or sponge, and allowed to dry:

℞.—Eau de Cologne ℥ij.
Zinci oxidi ℥ss.
Liq. carbon. deterg. ℥ss.
Aquæ dest. ℥xvij.—M.

S.—To be used as directed.

Scratching should be forbidden, and variations of temperature, especially exposure to dry heat, always aggravates.

Sometimes the method of applying dry powders, as in the treatment

of erysipelas by flour, oxide of zinc, starch powder, or calamine, gives relief.

Erythema multiforme, annulare, or *papulatum* may be treated in a similar way. Often the writer has seen the ordinary treatment for acute rheumatism (salicylates or alkalies) do much good. When bullæ form, ointments, such as the official zinc ointment, should take the place of lotions.

Erythema nodosum is often accompanied by severe pain, and calls for special treatment. The elevation of the limbs may give much comfort. Lotions of lead and opium may be applied on lint, and covered with oiled silk. The swellings may be painted over with collodion. The writer has obtained the best results by enveloping the legs in several layers of warm, absorbent wool, and applying, with moderate pressure, a light calico or woven bandage from the toes to the knee, while the patient is kept in the horizontal position, with the limbs somewhat elevated. Should there be any erythema multiforme also present, salicylic acid or its soda salt may be given. In very painful cases, a warm poultice, smeared over with the green extract of belladonna, or fomentations of poppy capsules, may be tried, but, as a rule, moist heat is not suitable.

Erythema intertrigo is best dealt with by removing all irritating secretions by gently rubbing the opposing or overlapping layers of skin with an oiled pad of wool or fine muslin, and dusting freely over with zinc powder, Fuller's earth, starch, or other harmless powder. The erythematous surfaces in fat people should be kept separated by a double fold of lint sprinkled with any of these powders, or the lint may be smeared over with zinc or lead ointment. In infants the intertrigo about the genitals and nates should be covered over with a firm ointment composed of zinc ointment 2 ounces, powdered calamine 2 drachms, and powdered starch 4 drachms.

For the treatment of Erythema Pernio see Chilblains, page 119.

EXOPHTHALMIC GOITRE—See Goitre.

EXOSTOSIS.

When the peduncle is small the growth may be removed with chisel and mallet, gouge, sharp spoon, saw, cutting pliers, or bone forceps. Sometimes after exposure the knife will be found sufficient when the base is fibrous and not bony. The majority of exostoses should be left alone, unless by their presence they are causing disturbance or producing deformity. Hard or ivory growths upon the cranial bones may be removed by freely exposing their bases, and applying from time to time strong sulphuric acid to the peduncle until the death of the exostosis is produced. This result sometimes follows ineffectual attempts at removal of the growth. The galvano-cautery may be tried, but it is of little use save in cases which could easily be otherwise treated.

EXTRA-UTERINE FŒTATION.

In the early months of tubal pregnancy, when this condition is suspected, absolute rest in the horizontal position must be insisted upon, and no straining or violent expulsive effort permitted. Colic and pain should be relieved by morphine, antipyrine, or any narcotic. The object at this stage (up until the third or beginning of the fourth month) should be to prevent rupture of the cyst, and up until the expiration of this period there is ground for hoping for the natural death of the fœtus and absorption or atrophy of its tissues.

Duncan strongly condemns all electrical, tapping or injecting methods of treatment in early tubal gestation as uncertain and dangerous. He urges that as the woman's life hangs upon a thread which may snap at any moment, the abdomen should be opened without delay.

Innumerable plans have been devised to cause the death of the fœtus. These have, for the most part, ended in failure, or they have produced rupture of the cyst and the death of the mother, though still, many insist upon the value of the interrupted current By far the best results have been obtained by making an exploratory abdominal incision, through which the fœtus may be removed if the diagnosis prove correct. This line of treatment is also applicable to those cases where rupture has already occurred.

Where there is evidence that rupture of the tube has already taken place there is no doubt about the wisdom of an immediate operation as soon as the patient can be rallied by ether and stimulants from the profound collapse sometimes resulting.

But when rupture takes place into the cavity of the broad ligament the case really becomes one of broad ligament hæmatocele, which if tapped or interfered with almost always ends fatally. If let alone the case is nearly certain to make a recovery though a slow one and suppuration may eventually result.

Dr. Strahan in his admirable prize essay on *Extra-uterine Pregnancy*, forcibly points out the surgeon's duty in cases where rupture has already occurred, not a moment is to be lost in opening the abdomen, and if the extreme prostration of the patient forbids operation she should be rallied by hypodermic injections of ether and intravenous injection of weak saline solution. He gives some striking instances of "resurrection" after the use of these means, and the hypodermic injection of 10 minims of a 1 per cent. solution of nitroglycerin followed by atropine.

After making an incision as for the removal of an ordinary ovarian tumer, the cyst containing the fœtus is exposed, and attached by sutures to the abdominal wound, after which it is opened freely and the fœtus removed. It is necessary to leave the placenta which, however, should be well drained through the cord to get rid of all available blood; it

can be removed afterward. The cavity of the cyst must be well washed out with antiseptics and proper drainage established.

Tait's method of dealing with the placenta is a very great advance in the surgery of this serious condition. He cuts off the umbilical cord as close as possible to the placenta, and after emptying the cyst of its fluid contents he hermetically shuts in the placenta in the cyst by accurate closing of the incision in the cyst-walls. He has also demonstrated that in those advanced cases where there is much distension of the broad ligament, the abdominal incision, if made well beyond the middle line on the side occupied by the tumor, will enable the surgeon to perform an extra-peritoneal operation, owing to the parietal peritoneum having been stripped off the pelvic and lateral abdominal walls.

Where cases of tubal pregnancy do not present themselves until the fifth or sixth month, the serious question arises about attempting to wait in order to give the fœtus a chance for life. In the absence of any symptoms of urgency this may well be done, but the greatest watchfulness and care must be daily exercised, the surgeon being prepared to operate by the lateral incision upon a moment's notice.

The operation may be performed through the vaginal walls by cutting through into the cyst with the cautery, but by far the best results follow the free abdominal incision.

The following are some of the methods proposed, and sometimes successfully carried out with the view of destroying the fœtus:

1. Tapping the cyst and removing the liquor amnii.

2. Electricity: *a*. By sending a strong continuous or interrupted current through the cyst; *b*. By passing a current of static or frictional electricity by a Leyden jar from the rectum and through the vagina; *c*. By galvano-puncture. This last is a most dangerous proceeding.

3. By the injection of narcotics as morphine, and antiseptics into the cyst. Gossman still insists upon the certainty and safety of hypodermic injections of ½ grain morphine into the sac.

4. By destroying the life of the fœtus through the mother by inducing mercurialization, mild strychnine, or other poisoning, or by giving ergot and purgatives. This barbarous treatment has been seldom tried. It has even been proposed to induce syphilis in the mother.

FAVUS

The management of this troublesome parasitic disease taxes to the utmost the patience of the physician. At the beginning, the reader may be reminded that the parasite will not live upon a healthy being. Hence the first indication for treatment will be to find out the "departure from health," and bring appropriate remedies to bear upon it. Pure air, good food, outdoor exercise, and warm clothing, with regularity in living, are essential. Failing nutrition must be met with cod-

liver oil and malt extracts, and the appetite should be stimulated by small doses of quinine with the mineral acids.

Local treatment must be vigorously and perseveringly pushed. The first step to be taken is to get rid of the accumulated crusts. This is best done by enveloping the scalp in a cap of lint soaked in spirit lotion and covered over with oiled silk. Poulticing and oiling are not satisfactory, but they may be resorted to occasionally for short periods. Epilation and parasiticides are the main remedies to be relied upon in the tedious struggle against the *achorion Schönleinii*. Blistering is to be pressed into the service occasionally, with the view of making way for other remedies to reach the parasite. All the remedies useful for ringworm of the scalp may be used against favus, and success depends more upon the judicious way in which these agents are used one after the other than in the persistent use of any of them. Thus, a solution of sulphurous acid (1 : 4) may be applied for some time until all the fungus confined to the surface is destroyed. A spray of sulphurous acid gas has given good results. Then a solution of corrosive sublimate (1 : 250 of spirit and glycerin) may be applied for a few weeks. Afterward, creasote, resorcin, carbolic acid, salicylic acid, thymol, myrtol, or oleum menthæ pip. may be applied in solution in spirit to which a little chloroform has been added.

If a greasy preparation or ointment be selected, the scalp should be well oiled to remove crusts, after which a weak ointment of iodide of sulphur (20 grains to 1 ounce) may be well rubbed in. It is the most reliable preparations of its class. The oleate of mercury ointment (5 per cent.) may be used with advantage. Epilation must be resorted to, and the process carried out with care and patience. A weak, continuous current by means of sponges soaked in sublimate solution has been recommended. It is clearly demonstrated that the disease is conveyed from the mouse to the cat and then to the children who nurse or play with the affected cat.

FEBRICULA.

The physician will constantly meet with cases where the only departure from health that can be noticed will be found in the increased temperature. Such cases *may* be safely let alone until the cause of the fever declares itself. Simple febricula lasts but a short time (forty-eight hours), and though a satisfactory termination may be safely calculated upon without treatment, nevertheless it is in the power of the physician to give very marked relief to symptoms. The same may be said in those cases where the feverishness is depending upon some other cause.

The patient should get a saline purgative ; 6 drachms of Rochelle salt in a tumblerful of lemonade is an efficient, speedy, and agreeable cathartic in such cases. He should be put to bed, he should have light

bed-clothing, and should only be permitted to take liquid food, as milk, rennet, whey, corn flour, arrowroot, gruel, weak tea, toast water, barley water, etc. The hot, dry skin should be induced to act by diuretics and diluent drinks. The following are good combinations for this purpose :

℞.—Tinct. aconiti ♏viij.
Aquæ camph. ℥vj.—M.
S.—Take a dessertspoonful every hour.

Or,

℞.—Liq. ammon. acet. ℥ij.
Spt. ætheris nitrosi ℥ij.
Potassii citratis ℥v.
Aquæ camph. ad ℥viij—M.
S.—Take a tablespoonful every hour.

Lemon-juice made fresh and diluted with hot water or warm barley water may be given *ad libitum*, or the lemon-juice may be administered with effervescing potash water or ice.

Antipyretics proper, as antifebrin, antipyrine, cold baths, etc., are not indicated in the treatment of febricula, or for the relief of a simple feverish condition depending upon some passing cause.

FEVER.

Under the heading of the different fevers, as typhus, typhoid, rheumatism, measles, scarlatina, etc., the treatment of the fever state, and of hyperpyrexia, will be mentioned.

FISSURE—See under Anus, Fissure of (p. 46).

FISTULA—See under Anus, Fistula of (p. 47).

FLATULENCE—See under Dyspepsia (p. 218).

FRACTURES.

The treatment of fractures is to be carried out on the simple principle of reducing any deformity by bringing the broken fragments of the bone together and securing them in this position by suitable splints, so padded as to overcome any tendency to override or return to their abnormal position.

As soon as a fracture comes under the care of the surgeon, no time should be lost in carrying out these principles. As in the case of dislocations, the great barrier to reduction is the reflex contraction of the muscles, and the sooner the attempt at restoration of the broken fragments to their normal position, the easier will the operation become. The popular idea of the importance of "setting" a fracture as soon as possible after its occurrence is therefore based upon sound pathology.

After the removal of the patient's clothing he should be placed upon a firm hair mattress, and the most gentle and thorough examination of the injured limb should be carried out, after which the surgeon, when all his appliances are at hand, proceeds to reduce the deformity. This should in all cases be achieved without the use of force, by so arranging the position of the limb as to cause the most complete relaxation of the muscles.

Rough handling may convert a simple into a compound fracture at this stage of the proceedings; hence the great necessity for obtaining the fullest relaxation of the muscles, so that the fragments may be brought accurately together without any pulling or hauling of the limb. This is achieved by an assistant grasping the limb firmly above the seat of fracture, while the surgeon makes very gentle traction upon the lower part, during which the bones come into apposition, guided by the gentlest pressure of the fingers when necessary.

Having secured accurate adjustment of the bones, a well-padded splint of wood, gutta-percha, perforated tin or zinc is applied on each aspect of the limb. These splints should be so shaped, moulded, or lined with padding as to apply when bandaged an even pressure over the limb. As they are adjusted to the fractured member the gentle extension or traction is to be kept up until the whole is enveloped in a good calico bandage. The use of a few straps and buckles to secure the splints in position before the application of the bandage is a great convenience. Much skill and experience is required in graduating the pressure of the bandage, which should not be tight, and the seat of fracture should be left free and exposed when possible.

After the bandaging, the limb must be carefully maintained in the position which affords the most complete relaxation of the muscles. The less it is interfered with the better, though careful inspection is to be constantly maintained, lest the bandages may get tight from subsequent swelling, as gangrene might thereby result.

The surgeon satisfies himself from time to time by passing his finger over the seat of fracture that the fragments are kept in position, and by passing his eye over the entire limb, and contrasting it with its fellow on the sound side, he sees that no rotation or deformity arises.

Cotton-wool affords the most tempting padding; it should, however, be very sparingly used. The writer, when in charge of the fracture cases in his house-surgeon days, discarded it entirely, owing to its liability to become lumpy and uneven, and used instead, a padding of strips of good old flannel, which answer every purpose perfectly.

In addition to the splints applied to the broken bone, it will be often necessary to use others, with a view of securing complete rest to the joints above and below the fracture, when their movement tends to disturb the position of the fragments. Extension and counter-extension may be required in special cases. Space will not permit of any enumeration of the various special appliances which are used in the treatment of different fractures. Those of them of any use fulfil

their purpose only in as far as they carry out the simple indication of insuring rest and accurate approximation of the ends of the broken bone, while nature makes good their repair.

Plaster, starch, glue, poroplastic felt, and other immovable casings may be used when the surgeon considers it necessary to permit the patient to move about. They are, if applied from the first, open to the serious objection of hindering inspection at the seat of fracture, but if applied after the progress of repair has been well and satisfactorily started, they are among the most valuable adjuncts which the surgeon can command in the treatment of simple fractures.

The time during which immobility is to be kept up varies much in different cases. Less than four weeks suffices in young subjects, but in the old more than twice this period may be necessary. As a rule it may be said that the mistake is sure to be made of keeping the entire limb in a state of absolute rest long after the necessity for such has passed away, to the great retardation of recovery. In most cases gentle massage or kneading, and cautious passive movements, may be commenced after the middle or end of the third week, the splints being again applied. This effectually prevents the formation of adhesions, and greatly increases the vitality of the tissues and minimises subsequent pain and stiffness.

Compound fractures are to be treated upon the same principles, with the addition of remedies suitable to the condition of the wound. All portions of loose bone are to be removed, the wound most thoroughly cleansed by washing out with antiseptic solutions, and if accurate approximation of the main fragments be not possible, excision of projecting spiculæ may be required. Thorough drainage must be secured where there is no hope of rendering the wound aseptic, and the limb so bandaged as to permit of daily inspection and dressing. Amputation or excision of the joint may be called for.

FRECKLES—See Chloasma (page 121).

FROST-BITE.

The affected part, if gangrene or vesication has not already set in, may in most instances be brought to its normal condition, even if white, hard, and insensible, by the judicious application of heat. The heat of the patient's own blood is by far the most effectual way of restoring the vitality to the benumbed part, and the way to secure this is by stimulating the local circulation through friction.

The sudden application of artificial heat may be followed by too rapid reaction, congestion, inflammation or gangrene. The gradual restoration which follows vigorous friction with dry snow is the most satisfactory termination. The part should be afterwards enveloped in fur, dry wood, or flannel.

Where gangrene has already occurred, the surgeon will probably find amputation necessary. As a rule, it will be advisable to use

antiseptics freely and to wait for a well-marked line of demarcation if there be but a small bulk of tissue destroyed. Where the gangrene affects a very superficial film of tissue, bichloride of mercury (1 : 2000) or permanganate of potassium (1 : 400) may be freely used.

FURUNCULUS—**See Boils** (page 70).

GALL-STONE.

The treatment will in the first instance, be directed to the relief of the agonizing pain produced by the passage of the stone along the ducts. Afterward measures may be tried with the view of causing the solution of the calculus, or of preventing the formation of new ones.

The pain is best relieved by a hypodermic dose of morphine ($\frac{1}{3}$ grain or more). Morphine ($\frac{1}{4}$ grain), opium (2 grains), chloral (20 grains), belladonna ($\frac{2}{3}$ grain of the green extract), antipyrine (20 grains), antifebrin (8 grains), ether (30 minims), turpentine (20 minims), may be given in suitable vehicles by the mouth if nausea or vomiting be absent. The dose may be repeated at intervals proportional to the severity of the pain. The hot bath (water at a temperature of 104°—108° F.) sometimes affords considerable relief. The patient should be kept immersed in the bath, under the surveillance of the physician or of an experienced attendant, until signs of weakness are observed. This treatment may often ward off attacks of pain if resorted to very early. Hot fomentations, local hot packs, and poultices, may be tried where a hot-bath is not at hand. Copious draughts of hot water, alone, or containing bicarbonate of soda (20 grains), may be given, and may be repeated notwithstanding the presence of vomiting.

Emetics often afford marked relief, and the writer has found patients resort to their use without being instructed, having themselves discovered the relief which had followed spontaneous vomiting in former attacks. Sulphate of zinc (30 grains), ipecacuanha (20 grains), tartar emetic (1 grain), apomorphine ($\frac{1}{10}$ grain hypodermically, $\frac{1}{2}$ grain by the mouth), mustard (a teaspoonful in 10 or 15 ounces of water), may be administered. Counter-irritation may give relief in some cases. Should the pain baffle the above list of remedies, chloroform or ether inhalation may be resorted to.

In patients, subject to attacks of biliary colic, the following mitrailleuse may be left in their hands for use in emergencies until the arrival of the physician:

℞.—Olei menthæ pip. ℥ij.
Spt. chloroformi ℥vj.
Spt. ætheris sulph. ℥vij.
Morphinæ hydrochlor. gr. ij.
Tinct. cannab. ind. ℥iij.
Spt. ammon. aromat. ad ℥iij.—M.

S.—A teaspoonful to be taken with a tablespoonful of whiskey in a wineglassful of water when the pain comes on. To be repeated in half an hour if the pain continues, and every four hours afterward until relieved.

Should vomiting continue after the attack, it may be relieved with lemon-juice and alkaline effervescing mixture, ice, bismuth and hydrocyanic acid, or sinapisms over the abdomen. Morphine perules, containing $\frac{1}{16}$ grain each, generally afford marked relief and check retching.

During the intervals between the attacks, the patient should be advised to take free open-air exercise several times daily, and, if possible, to give up sedentary habits or occupation. Diet should be plain, and only in amount sufficient to thoroughly maintain nutrition, all excesses in eating being injurious. Alcohol should be sparingly used, and starchy foods avoided. and animal fats, as far as possible forbidden.

Harley's method of expelling gall-stones, by manipulation of the abdominal walls by the fingers, may be tried for the expulsion of concretion in the gall-bladder or duct. Lately an operation of the same sort has been recommended under the title of "pumping the liver." It is performed by making firm and quick pressure on the ribs over the liver; after the pressure is made the hands are suddenly withdrawn.

Durande's remedy consisted of a mixture of ether and spirit of turpentine (3 parts to 2); 15 minims of this may be given in capsules, three times a day, during the intervals between the attacks, or every four hours while the attack is on. Turpentine alone appears to have some power also of dissolving or causing the solution of small calculi. The writer gives it in capsules (10 minims each) for weeks at a time in conjunction with the following treatment:

Alkalies are believed to have a prophylactic effect; and the most popular treatment, and one followed by great benefit, is a prolonged course of Carlsbad water or Vichy water before breakfast. Liquor potassæ (15 minims) bicarbonate of potash (30 grains), phosphate of soda (30 grains), castile soap (15 grains), salicylate of soda (20 grains), may be alternately tried.

The mineral acids, especially the nitro-hydrochloric acid (30 minims), iridin (1 grain), euonymin (1 grain), podophyllin ($\frac{1}{4}$ grain), calomel (1 grain), green iodide of mercury ($\frac{1}{8}$ grain), purgatives, and so-called hepatic stimulants, have been given with doubtful success with the view of so increasing the amount of bile as to favor the solution of the stone.

The extraordinary successes said to have followed the administration of large doses (20 to 40 ounces) of olive oil require confirmation, though many reports show that benefit may be derived from doses of 5 or 6 ounces, taken in divided amounts, over one or two hours.

The writer has seen large numbers of calculi expelled by one heroic dose of calomel (15 grains), followed by a large dose of castor oil.

Electricity, in the form of the faradic current, with one electrode over the gall-bladder, and the other over the spine, has been tried. with the view of causing vigorous contraction of the muscular fibres of the gall-bladder and its ducts, and in a few cases has been found successful.

Where the common duct remains obstructed by a calculus, or where the patient's life is rendered unendurable from incessant attacks of biliary colic, or where the gall-bladder is found to be distended, or where suppuration, ulceration, or perforation, resulting from calculi, is believed to be present, surgical procedure is not only justified, but may become urgently imperative.

The operation of cholecystotomy is performed by making a vertical incision, 2 to $2\frac{1}{2}$ inches long, external to the border of the right rectus muscle, commencing one to two inches below the costal arch. This is the usual situation of the tumor if present. The point of the tenth rib is a good guide in the absence of swelling. Having felt the gall-bladder by the finger thrust into the wound (after ligature of all bleeding points), its contents are drawn off by the aspirator. The collapsed sac is then drawn forward, its walls incised, and their margins stitched to the parietal wound, after a thorough exploration and evacuation of any calculi in the gall-bladder or ducts. Impacted calculi may be removed with forceps or scoop, or they may be crushed or broken up with forceps, and the *débris* washed out with a stream of warm water. A rubber drainage-tube is inserted into the cavity, and left projecting from the skin wound. After all discharge has ceased, the tube may be removed, and the fistulous opening left to close spontaneously.

This operation is safer and more satisfactory than that of sewing up the incised gall-bladder, and returning it within the abdominal cavity, and it is to be preferred to cholecystectomy, or excision of the dilated gall-bladder, as performed by Langenbuch.

GANGLION.

The small, simple ganglions found upon the posterior surface of the wrist may be best treated by rupturing their walls, and squeezing the jelly-like contents into the neighboring tissues. This is best done by forcibly bending the wrist-joint to make the tumor tense, and then, by applying strong pressure with one or both thumbs, the ganlion can nearly always be ruptured. A smart blow with a blunt instrument may be tried, but this is not desirable. If the ganglion cannot be burst with the surgeon's thumb, it is better to insert a fine-grooved needle or slender knife-blade, and puncture the cyst, after which the contents may be squeezed out. Pressure by a pad of lint and a firmly-adjusted bandage generally is all that is required.

When the tumor returns, a blister may be applied after a second evacuation, or the strong tincture of iodine may be repeatedly applied. The writer has caused old recurring ganglions to disappear permanently by folding a coin (a penny) in a piece of lint, applying it accurately over the tumor, and bandaging it tightly for several hours, taking care that the circulation in the fingers is not seriously interfered with.

In large ganglions, especially those containing melon-seed bodies, a

free incision must be made, and the contents thoroughly evacuated under antiseptic spray, and a drainage-tube left in until the cavity contracts. The old method of slitting up such cysts, and allowing them to granulate from the bottom, is not free from serious danger. The washing out of their contents with weak corrosive sublimate or iodine solutions, and the establishment of thorough drainage under antiseptic dressings is preferable.

GANGRENE.

The cause of the affection is to be first determined; should the case be one of static gangrene, the immediate attention to the state of the circulation is demanded. Thus pressure, whether caused by constricting bands (as in hernia), by splints and bandages (as in unskilled surgery), or by the pressure of tumors or inflammatory swelling and tension, should be, if possible, at once relieved.

After the removal of the constriction, if the death of the part has not already taken place, it may be averted by the application of dry warmth, elevation of the limb, and gentle friction or message to empty the large venous trunks.

Swathing of the limb or part involved in several layers of dry cotton wool, after friction, should be performed without applying a bandage.

If the death of the part is beyond question, immediate or speedy amputation should be performed, as nothing but evil generally follows delay in these cases. The line at which the constriction takes place is an accurate limit to the amount of destroyed tissue.

Traumatic gangrene, if of very limited extent, may be dealt with as an ordinary sloughing sore by antiseptic solutions. If the slough has not separated, its removal may be facilitated by hot poultices sprinkled over with fresh charcoal.

When a portion of a limb is completely destroyed by traumatic gangrene, amputation must follow. It is, upon the whole, safer to wait for a line of demarcation.

In spreading traumatic gangrene, some authorities recommend immediate amputation, without waiting for a line of demarcation, but the weight of authority appears to be against this. It is better to wait for some evidence of a limit to the gangrenous process. This is especially true if the cause is *constitutional.* Exception may sometimes be made in the presence of a cause obviously *local.* Every effort must be made to keep up the strength and nutrition of the patient to diminish tension, and to guard against septic poisoning.

In gangrene caused by plugging or by ligature of a main artery, or by the pressure of an aneurism, amputation may be performed at once, without waiting for a line of demarcation.

In senile gangrene it will generally be found wise not to interfere until a well-marked line is formed, the patient's general condition being closely watched, and the affected limb enveloped in dry and warm antiseptic dressings.

Hospital gangrene must be promptly met by isolation and thorough ventilation, free stimulation, and large doses of iron and quinine. Sloughs should be removed, and the affected surfaces thoroughly irrigated with warm antiseptic lotions, or cauterized with the actual or galvano-cautery, iodine, bromine, or nitric, strong carbolic or other acid. The most rigid antiseptic treatment must be carried out.

GANGRENE OF THE LUNG—See under Lung.

GASTRALGIA.

The treatment will resolve itself (1) into the management of the case during the attack, and (2) to measures employed in the intervals between the attacks.

Pain may be relieved by opium, and if very severe by hypodermic injection of morphine. Cannabis indica sometimes affords prompt relief. The use of narcotics is, as already mentioned, most objectionable in ailments of a chronic nature where there is danger of the opium habit being established. In stomach troubles opium, if given in doses large enough to affect the cerebrum, always interferes with digestion and appetite seriously. Chloral (10 grains), antipyrine (10 grains), chloroform or ether (5 minims), nitro-glycerin (1 or 2 minims of a 1 per cent. solution), bicarbonate of soda (30 grains), oil of peppermint (5 minims), oil of cajuput (4 minims), creasote (2 minims), belladonna (20 minims of tincture), hydrocyanic acid (4 minims) may be tried from time to time.

The writer has obtained best results from a large dose of bicarbonate of soda (40 grains) combined with morphine ($\frac{1}{8}$ grain).

Counter-irritation by mustard, hot fomentations, or even iced poultices may give speedy relief.

Electricity in the form of the continuous current sent through the epigastric region, or of the faradic current applied to the sympathetic or pneumogastric, may shorten the attack without resorting to narcotics.

Sipping of very hot water may be tried—it often aggravates. Acupuncture, or hypodermics of warm water sometimes afford relief. Chloroform liniment alone or mixed with the liniment of belladonna, or aconite, sprinkled upon lint and covered with oiled silk is a valuable method of diminishing sensibility.

For the treatment of the case between the attacks much may be done, and the physician should look out for evidence of some organic or other affection of the stomach. Pure neuralgia of the stomach is a rare disease. Gastritis, ulcer, cancer, dyspepsia, or obstruction of the pylorus may be present, and may be the direct or indirect cause of the attacks of gastralgia. Appropriate treatment (see under the head of each) should be directed to the primary affection. In the absence of any stomach ailment save the repeated attacks of gastralgia, treatment should be directed to the nerve supply of the stomach. Reme-

dies found useful in the cure of neuralgia in other parts of the body have been sometimes productive of great good in gastralgia. Quinine in moderate doses (2 grains), gradually increased to 5 grains three times a day may be tried with advantage.

Arsenic in small doses is a valuable drug if given for a sufficiently long period. One minim of Fowler's solution before meals in a tablespoonful of water should be given for a few weeks, and then 2 minims after meals, and so on alternately for three or four months.

Alum is successful in a considerable number of cases when given in doses of about 15 grains three times a day between meals. It appears to act in gastralgia somewhat like the way in which it relieves painter's colic.

Bismuth in large doses has been given with great benefit in some cases, and as much as a quarter of a pound daily has been administered. There does not appear to be any advantage in such heroic doses, but half drachm doses of the carbonate will meet all requirements when given four times a day before meals.

Charcoal given in wafer paper before, or three hours after meals has been known to cause the disappearance of the attacks. It can be used also when the attack is on, the same remark applies to creasote.

Salts of silver (½ grain of the nitrate and 1 grain of the oxide) may be given for short periods. Salts of iron often irritate; the carbonate (precipitated) in 40 grain doses is the best. Salts of zinc, the valerianate, or the oxide (5 grains) may be tried. Ergotine has been highly recommended, but the writer never saw any benefit from it. Iodide of potassium (3 grains), binoxide of manganese (5 grains) have been also used. Salicin (30 to 45 grains), salicylic acid (20 grains), and resorcin (5 grains), appear to act like quinine, and are valuable in cases when the neuralgic history is clear. Minute doses of strychnine, or nux vomica, are useful adjuncts. Ferments like papain, pepsin, pancreatin, and trypsin may be used with advantage as they assist digestion, and save some of the work done by the gastric mucous membrane. They may be employed at the time of the acute attacks, and may also be given after or along with meals, while the patient is undergoing a quinine, bismuth, arsenic, or other course. Scrupulous attention to the quality, quantity, and regularity of diet is an essential point.

GASTRIC ULCER.

The first indication in severe cases is *absolute* rest to the stomach, both physical and physiological. This is obtained by insisting upon the patient keeping the recumbent position, and being fed by the rectum. Another essential to obtaining absolute rest to the ulcerated organ is the administration of small and repeated doses of opium, morphine, or codeine. The nutrition of the body can be maintained for long periods by nutrient enamata, and these are necessary in all severe cases and whenever hemorrhage is present.

A nutrient enema should not exceed 5 ounces at the most; about 3½ ounces is the most suitable bulk. The ordinary beef tea, milk, egg and salt enema, thickened with starch, is for the most part absorbed, but it is too irritating, and soon sets up an irritable condition of the rectum. It may be much improved by adding a teaspoonful of liquor pancreaticus to each wine-glassful of enema, and a few minims of laudanum to assist its retention.

Leube recommends the injection of finely divided meat mixed with pancreas. Such an enema may be prepared by mixing 4 ounces of finely sliced and minutely chopped meat with 1 ounce of chopped pancreas and a large tablespoonful of warm water. This may be injected through a wide-nozzled warm syringe.

The writer has found that Griffin's nutrient suppositories are excellent substitutes for peptonized enemata, and possess many advantages.

Where the symptoms are of a mild type—hemorrhage, severe pain, and persistent vomiting being absent—the patient may be allowed to sit up or to cautiously move about, and feeding by the mouth may be permitted.

Solid food, or nourishment containing hard or coarse particles, must be strictly forbidden. The diet should consist chiefly of milk. This should be administered in very small quantities, and as frequently as possible. The success of treatment will to a very large extent depend upon the care exercised in feeding the patient. (See directions given under Cancer of the Stomach on page 102.)

Kali or potash water, or lime-water, may be mixed with the milk in proportion to the symptoms (acidity, flatulence, etc.) present in each case. As the case progresses, good arrowroot, corn-flour, or other *impalpable* farinaceous powder may be cooked with the milk. A little later on, sago, tapioca, and ground or well-boiled rice may be given. Beeftea, chicken soup, meat juices and jellies, and well-cooked puddings, free from fruit and spice, can be given. Farola and fine oat flour make palatable blanc mange, which can be eaten with renneted milk. Any food found to cause acidity must be discontinued, the presence of marked acidity having an injurious effect upon the healing process.

As the symptoms disappear and the progress of the case shows that the ulcer is probably cicatrized, solid food must be most cautiously permitted in small quantity, beginning the experiment with well-boiled soft white fish, followed up with young chicken, and finally tender under-done roast beef, steak, and chop. Alcohol is, as a rule, objectionable, and sugar should be avoided.

The different symptoms present during the open stage of the ulcer must be met by appropriate remedies. Thus, if hemorrhage occurs, in addition to rectal feeding small pieces of ice should be swallowed and a compress of ice laid over the stomach. Ergot may be given by the bowel, though its value is doubtful. Opium by the bowel is service-

able, and rarely will acetate of lead and other powerful astringents be required. Teaspoonful doses of hazeline may be tried, and turpentine capsules are useful. Tincture of iron is of doubtful service, though praised by some. Powdered kino is a valuable remedy. (See also under Hæmatemesis.)

Saline purgatives, as Epsom salts, to thoroughly clear out the blood which may have passed onward into the intestines, are strongly advised by Ord, who emphasizes the importance of thus getting rid of this source of great irritation. He combines sulphuric acid with the purgative, and for the gastric hemorrhage he does not recommend the usual astringents.

Vomiting must be controlled by ice internally, and counter-irritation externally, bismuth and hydrocyanic acid, creasote capsules, and *small* doses of morphine. Where milk cannot be tolerated, potash or Seltzer water may be added in equal quantity to it. The writer has seen a mixture of acid buttermilk and potash water often retained where milk was vomited. Rectal feeding may increase the trouble in some cases where there is copious acid gastric juice, and the writer has seen vomiting come on in one chronic case of irritable ulcer every time an enema was given; this is, however, rare. Peptonized milk is disappointing.

Pain is an indication for perfect rest, blisters, leeching, cold compresses or warm poultices, and morphine. As already mentioned, it is a mistake to give morphine in large doses in these cases. It will be rarely necessary to give more than $\frac{1}{16}$ grain, in perule or in solution. If the system be brought under the influence of opium, further vomiting is apt to supervene.

Atropine, in doses of $\frac{1}{2}$ a minim of (1 : 100) solution, sometimes checks pain and vomiting where opium is badly borne.

Bismuth, in the form of powder in small doses, acts as a sedative, and relieves pain as effectually as it stops vomiting. If given in the liquid form it may be combined with hydrocyanic acid and morphine thus:

℞.—Bismuthi subcarb. ℥ij.
Acid. hydrocyan. dil. ℥j.
Morph. hydrochlor. gr. j.
Mucilag. acaciæ ℥vj.
Aquæ chloroformi (1 : 200) ad ℨij.—M.

S.—Take a teaspoonful every three hours; shake the bottle well.

In chronic cases Fowler's solution, in doses of 1 minim, relieves pain and checks vomiting.

Charcoal and creasote in capsules are invaluable in such cases. Cannabis indica, $\frac{1}{4}$ grain of the extract in a minute freshly prepared pill, may be tried.

Carlsbad waters before meals, by neutralizing excessive acid, sometimes afford considerable relief. Any alkali, or even borax in small doses, may be used with the same object in view.

Pepsin has been said to have caused death by finding its way directly into the circulation through the open vessels of the ulcer; this is highly improbable.

Ord uses the following combination in the treatment of gastric ulcer without catarrh—*i. e.*, 20 grains of subcarbonate of bismuth, 10 grains of carbonate of soda, and 10 drops of tincture of belladonna three times a day.

When there is much evidence of catarrh he uses what he calls Brinton's mixture until the catarrh subsides. The following is his formula:

℞.—Potas. bicarb. ℥ij.
Potas. iodid. gr. xxxvj.
Acid. hydrocyan. dil. ♏ xxxvj.
Inf. gent. comp. ad ℨvj.—M.

S.—Take a tablespoonful three times a day; shake the bottle well.

Blisters are of great benefit in chronic cases.

Remedies may be tried in chronic cases with the view of acting as caustics or stimulants to the ulcerated surface.

Nitrate of silver, in the form of pill, may be given in doses as large as 2 grains. This treatment should not be persisted in. The oxide may be given in the same way in doses of 3 or 4 grains.

Bichloride of mercury ($\frac{1}{50}$ grain) and bichromate of potassium ($\frac{1}{50}$ grain) have been tried with but doubtful benefit. Nitrate of uranium, in $\frac{1}{8}$ grain doses, is recommended when the ulceration is believed to extend to the duodenum.

Brinton believed that opium had a very marked influence in causing the ulcer to heal.

In chronic irritable ulcer the washing out of the stomach has been recommended. The writer has obtained highly satisfactory results from this treatment. The ordinary stomach-pump should not be used for this purpose. A soft rubber tube, about one yard in length, should be employed. The end introduced into the stomach should be rounded off like the tube of the stomach-pump, and a glass funnel should be attached to the other end. With this instrument a stream of fresh warm water can be poured into the stomach through the funnel raised to the level of the patient's face; by depressing the funnel the fluid is easily syphoned off. After the contents of the stomach have been removed a stream of weak antiseptic solution—chloroform water (1 : 200) creasote (40 minims to 40 ounces), boric acid (2 drachms to 40 ounces), common salt, and borax (2 drachms to 40 ounces) may be passed through the washed organ. Weak Condy's fluid answers well.

It is needless to say that the utmost gentleness is to be used, and the stomach should not be dilated by the pressure of a high column of the fluid.

Where perforation occurs, and the contents of the stomach find their way into the peritoneal cavity, the situation of the patient becomes one

of the greatest gravity. Absolute rest and opium in large quantity may be administered, and all food by the mouth must be stopped, and ice applied externally. Such cases nearly always die, though the writer has been fortunate enough to witness one permanent recovery, and one case which long afterward succumbed to an abscess of the liver and empyema. The best treatment is early abdominal incision, washing out of the peritoneal cavity with hot water, and the establishment of good drainage. (See under Peritonitis.)

GASTRITIS.

Unfortunately the term gastritis has been applied by different writers to totally different diseased conditions. If we reserve the term *acute gastritis*, for those cases of severe acute gastric catarrh, accompanied by serious vomiting, nausea, and depression, the treatment will be that already detailed under Ulcer of the Stomach. After remedying the cause of the gastritis, *i. e.*, alcoholic excess, indiscretion in food, irritant poisons, etc., the stomach must get absolute physical and physiological rest. As the duration of the acute affection is so short, rectal feeding will be seldom necessary. In the subacute or chronic forms it must be resorted to. Counter-irritation by blisters, sinapisms, dry cupping, iced compresses, or, where these aggravate the distress, hot poultices may be applied.

Opium, by the rectum or hypodermically, or morphine perules, or dry morphine placed upon the tongue, are indicated in most cases. Ice may be swallowed in very small quantities at frequent intervals, and, as the nausea and vomiting yield, milk may be given in spoonfuls.

Calomel, 5 or 6 grains placed upon the tongue and washed down with a spoonful of iced water, may cut short the attack.

Bismuth, hydrocyanic acid, creasote, or any of the remedies mentioned under Ulcer of the Stomach as useful for vomiting; may be given.

Arsenic, in small doses, has its advocates, but its use is not free from danger; if the symptoms have resulted from an irritant poison, its administration may cause serious aggravation.

The *subacute* variety may be treated on the above lines. In *chronic* gastritis, the first duty of the physician is to determine, if possible, the cause of the affection. Errors in diet, excesses in eating or drinking, especially in the use of alcoholic stimulants, should be corrected, after which the dyspepsia, vomiting, nausea, pain, gastric tenderness, etc., should be treated upon the principles already laid down in discussing the treatment of Dyspepsia, Gastric Ulcer, etc.

Ord lays great stress upon the value of iodide of potassium in gastric catarrh, administered with some bicarbonate of soda. It is, in his opinion, a drug of inestimable value, and speedily removes simple gastric catarrh, and prolongs life in malignant disease.

GENU VALGUM (Knock-knee.)

GENU EXTRORSUM (out-knee) and BOW-LEG are deformities owing their origin generally to errors in feeding, to malnutrition, and rickets, knock-knee being often caused by too much standing or the carriage of heavy weights in growing and feeble youth. These affections can be, for the most part, successfully treated if the case is seen in the early stage before development of the bones has been established.

The first indication is to insist upon *complete rest* in the horizontal position in bed. The weight of the body must be taken off the yielding ligaments and softened bones for a considerable period.

The nutrition must be improved in every way, and the diet carefully seen to. The various measures mentioned under the head of Rickets should be applied to those cases coming under that category.

Massage of the affected limbs should be performed at least twice a day. Friction and manipulation, with a view of exerting pressure to correct the bending, may be performed by the nurse or parent several times daily.

Bandaging the limbs to suitable splints, selected as sound common sense and some surgical or mechanical knowledge may dictate, will bring the deformity back to the normal standard when rest and massage fail. In knock-knee, a firm cushion of flannel or wool may be placed between the knees, and both ankles may be bandaged together. Where one knee only is affected, the limb may be strapped neatly and uniformly to a suitable splint, the bony prominences being well protected by suitable padding.

In bow-leg a double-padded splint may be placed between the legs, extending from near the perineum to some inches beyond the soles of the feet. To this splint both legs should be evenly bandaged.

It is a good practice to resort to splints, even in mild cases, since their use enables the child to be safely carried or driven out in the open air without the risk of his leaning his weight upon the limbs. Standing should be rendered impossible by the adjustment of the splints. Massage may be performed at night. In severe cases attempts may be made to straighten the limb under chloroform, and, in confirmed, long-standing cases, osteotomy is the only available procedure.

GLANDERS.

Stimulants, and abundance of concentrated, easily-digested, sustaining food, should be administered in all cases of this serious affection.

The seat of inoculation, when recognized, should be freely cauterized by the galvano-cautery. All swellings and local collections of pus should be freely incised at an early stage, and the cavities, after being syringed, may be well mopped out with creasote and cotton wool on a stout probe.

The free use of antiseptic solutions and inhalations afford the best prospects of limiting the terribly destructive inflammation.

Drugs are of little avail in the acute cases, but of much avail in the chronic forms of the disease.

Sulphocarbolates rank highest. Twenty grains of the soda salt three times a day should have a fair trial. Where there is much prostration, large doses of ammonia are indicated.

Quinine, 5 grains every four hours, dissolved in 15 minims of the tincture of chloride of iron, may be given.

Arsenic, iodides, carbolic acid, and strychnine have their advocates.

Gold has recently reported a bad case which was successfully treated by a great number of mercurial inunctions, so as to saturate the system with mercury, as in syphilitic treatment. The tumors were opened, and the edges of the wounds in some cases touched with the cautery, and dressed with antiseptic lotions.

Symptoms, as they arise, such as pain, diarrhœa, profuse perspirations, rigors, vomiting, etc., must be met by appropriate remedies. The air of the patient's room should be kept saturated with the vapor of carbolic acid, terebene, or turpentine, and the greatest care exercised against inoculation of the virus on the hands or face of his attendants.

GLANDS, Diseases of—See Lymphadenitis and Scrofula.

GLAUCOMA.

It is just possible that the discovery that eserine or Calabar bean has a marked tendency to diminish the tension in glaucoma has not been an advantage. Though mild cases of the disease are relieved, and not a few permanently cured, by the free instillation of a solution of eserine (1 : 250), nevertheless, it may mislead the surgeon by giving a transient relief in severe cases, and tempt him to postpone radical or surgical treatment until the sight is totally destroyed, and the case placed beyond the reach of art.

The severe pain calls for relief, and while awaiting positive evidence for diagnosis, eserine may be used.

Opium or morphine, hypodermically, leeching, and warmth to the affected eye, with a sharp purgative of the saline class, will affect very considerable relief. It should, however, always be understood that such measures are not to be relied upon, save as a means of rendering the patient's condition tolerable until marked increase of tension demonstrates the serious nature of the affection.

Belladonna must not be used, from its dangerous power of increasing the pressure within the eyeball.

Of all the operative procedures practised or recommended for the relief or cure of glaucoma, there is none which has yielded such satisfactory results as iridectomy.

Iridectomy, to be successful, should be made by a large wound, partly in the sclerotic, and not entirely in the cornea, and a large portion of the iris, at least one-fifth of the whole, should be removed up to its ciliary attachment, partly by cutting and partly by tearing.

Cocaine can hardly be depended upon to produce the thorough anæsthesia necessary, and ether has the disadvantage of adding to the vascular pressure. Chloroform should, therefore, be selected.

Sclerotomy, or the making of a wound in the sclerotic, as if an iridectomy was about to be performed, has in many cases been successful. The knife (Graefe's) should be entered about 2 mm. behind the corneal margin. It is, upon the whole, a much less satisfactory operation than iridectomy, and often ends in this operation, through prolapse of the iris, which must be removed. It is, however, found, in many cases requiring a second operation, that sclerotomy may answer all purposes when the previous operation has been iridectomy.

Trephining a circular piece out of the sclerotic behind the ciliary region (about the level of the ora serrata) has been practised by Robertson. It has not met with much favor, and may end in some cases in iridectomy, owing to the adhesions of the periphery of the iris to the cornea, which often form in glaucoma.

Paracentesis of the aqueous humor from the anterior chamber may be successful sometimes.

Hyposcleral cyclotomy, performed by cutting through the ciliary body in the antero-posterior direction by a narrow Graefe's knife, has some advocates.

Enucleation, or stretching of the supra-trochlear branch of the fifth nerve, may be tried where total blindness exists with glaucoma for same months, or should there be much severe neuralgic or inflammatory pain in the eyeball or in the region of the orbit.

GLEET.

In the treatment of this troublesome affection, which almost always has its origin in gonorrhœa, the remedies suitable to gonorrhœa may be tried with a fair hope of success. This is especially true of cases coming for the first time under notice when there is a history of a neglected or badly treated attack of gonorrhœa. Where the disease is of many months' duration the ordinary gonorrhœal remedies are worthless, and time need not be wasted in their trial.

The general health should be improved in every way possible, and complications, such as constipation, anæmia, dyspepsia, and oxaluria, should be corrected by appropriate remedies. Stimulants, excessive smoking, sexual intercourse, over-eating, and indulgence in articles of food which experience has proved to aggravate the discharge, as tea, pickles, beer, etc., must be strictly prohibited.

Excessive fatigue is as injurious as spending too much time in bed. Sea-bathing, when the season permits, or cold baths indoors and moderate open-air exercise, are beneficial in all cases.

Constitutional remedies, as tonics, consisting of full doses of tincture of iron (15 minims), with 3 grains of quinine, or teaspoonful doses of Easton's syrup, often do good. Tincture of cantharides, in doses of 2 or 3 minims, is a favorite remedy with many surgeons. The writer

has no experience of the drug in this disease. He has seen excellent results from tonic treatment, with one dose of boric acid (10 grains), given at bed-time every night. Turpentine may be used instead of cantharides.

The local treatment of gleet is by far the most important, and the number of remedies is almost endless. Nearly every known astringent and antiseptic has been injected down the urethral canal for the cure of this disorder.

By far the most successful of all local remedies is the passage of a solid silver or plated graduated sound with a wide curve. Sir Henry Thompson's old-fashioned tapering, solid, heavy bougies are the best instruments for general use. One of them, well lubricated, should be permitted to glide into the bladder by its own weight. The size selected should be of the full diameter of the urethra; it should be left *in situ* for a period of a few minutes at first, and this period should be gradually lengthened at subsequent sittings and a larger instrument employed each time until No. 15 (English) is reached. Any lubricant may be used; the writer uses the glycerin of borax (1 : 6). The present official preparation is worthless owing to its fluidity. Most cases of gleet will be found to yield to this treatment if carried out for some weeks. Twice a week will be about the best rule for guidance as regards the frequency of the sittings. The advantage of this treatment lies in its freedom from danger when contrasted with the injections of strong astringent solutions. Moreover, it effectually remedies any stricture or narrowing of the urethra which is found so frequently associated with gleet. The persistent use of the solid bougie, in the writer's opinion, will also prevent the formation of stricture.

Nearly every known antiseptic may be smeared upon the bougie if made into a stiff ointment. Special grooved instruments are made for the application of solid ointments, but these are unnecessary, as owing to the adhesive nature of lanolin, any substance incorporated with it will adhere to the end or curve of the ordinary bougie, and may be carried down and left in contact with the diseased area.

The passage of silver *catheters* for the treatment of gleet is thoughtlessly recommended by many authorities. They should never be employed as simple dilators; the solid bougie, being incapable of entangling any projecting folds of membrane, should be preferred.

Iodoform (30 grains), mixed intimately with 1 ounce of Burroughs & Welcome's elegant ointment of hazeline, is a valuable lubricant. Carbolic acid, resorcin, nitrate of silver (5 to 15 grains to 1 ounce), copaiba, santal oil, iodide of sulphur (5 grains to 1 ounce) may be used in this way.

Where a more complete local application is required the drug may be incorporated with a firmer basis, made into bougies, which can be passed down the urethra and left to melt by the heat of the body. Unna's bougies contain (1 : 100), nitrate of silver, and are made with cacao butter and a little wax and Peruvian balsam. Antrophores are

especially prepared bougies, consisting of sulphate of thallin (2 to 6 per cent.). Excellent results are obtained by their use in chronic gonorrhœa and gleet.

In the absence of these, thallin, iodoform, nitrate of silver, or other drug made into a creamy consistence with oil, gelatin, or mucilage, may be injected through a soft rubber catheter passed down to the seat of the mischief.

The various urethral syringes may be employed to cauterize any part of the canal which is found by Leiter's urethroscope to be diseased. Tiemann's or Harrison's irrigators, Guyon's bullet-catheter, or Thompson's prostatic injector are the best. Twenty grains of nitrate of silver to 1 ounce distilled water is the usual strength; of this 10 to 20 minims may be injected, cocaine having previously been injected, and the patient should remain afterward in bed for the day.

Otis treats gleet in the following manner: He first dilates gently the urethra to its full extent, without using force; then a silk *coudé* catheter is introduced just beyond the compressor urethræ muscle, so that the eye lies in the neck of the bladder, then about 8 ounces of fluid injection is introduced into the bladder by a syringe. The patient passes this after the withdrawal of the catheter, thus flushing out the urethra thoroughly.

The first injection consists of 1 part each of sulphate of zinc, alum, and carbolic acid in 2000 parts. Upon the second day the water is reduced to 1500, and upon the third day to 1000, and upon the fourth day to 500 parts (1 grain to 1 ounce nearly). Upon the fifth day solution of permanganate of potassium (1 : 2000) is used, upon the sixth 1 : 1500, upon the seventh 1 : 1000. Afterward the solution is changed to one of nitrate of silver (1 : 1000), gradually increased to 1 : 100.

If these fail, a few drops of a 5 per cent. nitrate of silver solution is passed into the deep urethra by the drop syringe.

Of injections for gleet the following may be used:

Sulphate of zinc (3 grains to 1 ounce).
Nitrate of silver (1 grain to 1 ounce).
Tincture of iodine (2 minims to 1 ounce).
Corrosive sublimate (1 grain in 10 ounces).
Sulphate of thallin (5 grains to 1 ounce).
Tannin (5 grains to 1 ounce).
Creolin (5 per cent.).
Bismuth (30 grains to 1 ounce, with mucilage).
Acetate of lead (10 grains to 1 ounce).
Sulphate of copper (3 grains to 1 ounce).
Iodoform (20 grains in 1 ounce of oil).
Eucalyptus oil (1 in 30 of oil).
Sulphocarbolate of zinc (2 grains to 1 ounce).
Permanganate of potassium (1 grain to 1 ounce).

Blisters or counter-irritation to the perineum may be useful in some cases.

GLOSSITIS.

If the affection arises from mercurial salivation or from iodism, the cause must be seen to, and the administration of the drugs stopped. Should there be great swelling, threatening suffocation, free linear incisions must be made. This course was necessary in a severe case under the writer's observation following the bite of a rat. The incisions in this case had to be deep, but this is rarely necessary. They should be made on each side of the middle line, from behind forward. Leeches or minute punctures may be employed where the organ protrudes from the mouth. Hot fomentations by solutions of

Carbolic acid (1 drachm in 12 ounces of water);
Chlorate of potash (3 drachms to 1 pint);
Borax or boric acid (4 drachms to 1 pint); or,
Alum (2 drachms to 1 pint), afford relief.

Poultices to the front and the inhalation of moist warm air should be tried.

Saline purgatives or croton oil may be used to cause speedy evacuation of the bowels.

As soon as the local symptoms show any formation of pus, a bold, free incision should be made deeply into the abscess by a narrow-bladed knife, and a warm lotion of permanganate of potash (5 grains to 20 ounces) should be freely used.

Syphilitic glossitis yields to small doses of mercury (biniodide), and excellent results are obtainable by Heath's method of pickling the tongue in mercurial solution. He uses ¼ grain of the bichloride dissolved in 1 ounce of water, and makes the patient hold this in his mouth for ten minutes by the watch, three times a day, breathing through his nose all the time. He affirms that the result is often astonishing.

GLYCOSURIA—See Diabetes.

GOITRE.

The constitutional treatment of goitre will embrace the removal of the patient from the district in which the disease is indigenous to a healthy locality with a pure water supply.

Iodine, iodide of potassium (5 to 10 grains three times daily), hydrofluoric acid (10 minims of a ½ per cent. solution) are the drugs to be relied upon. They are occasionally of some use in the soft fibroid or parenchymatous forms, but prove useless in the treatment of the cystic varieties. It is very doubtful if the hydrofluoric acid is of much service. Sometimes the iodine treatment, combined with change of residence and supplemented by local applications of iodine or blistering, will effect a permanent cure.

Local treatment may be tried in many forms, the most innocent of which is the daily application of the U. S. P. tincture of iodine. If a

decided counter-irritant action is desired, the undiluted liniment (1 : 8) may be painted on layer after layer till vesication is produced.

Iodine ointment may be used instead of the liquid preparation. Some surgeons have found better results from the application of a weak solution, applied with the view of effecting absorption of the iodine. In this case, half tincture and half glycerin or weak spirit may be employed, the object being not to injure or destroy the cuticle. Ointments of iodides of ammonium, cadmium, and lead have been used (1 drachm to 1 ounce); they possess no special advantages over the pure iodine.

Biniodide of mercury has removed goitres by the thousand in India. It has been of little use in this country. The Indian practice is to rub in for ten minutes an ointment consisting of 3 drachms of the biniodide to 1 pound of lard. The patient is afterward to sit with his goitre exposed to the direct rays of the sun until he is unable to bear the smarting. After this some more ointment is gently applied, the patient is sent home, and the case seldom requires further treatment.

This method of dealing with goitres might be worth trial during the early days of July, when our sun is at his best.

Blistering with vesicating collodion, combined with internal iodine treatment, has given moderate success in soft parenchymatous goitres, and may be tried before more formidable remedies are decided upon.

Setons passed through the substance of the gland gave excellent results in the hands of Mr. Hey, but the following treatment is less dangerous and more efficacious for the soft solid goitre.

Injection of iodine into the tumor is by far the most satisfactory means of reducing the enlargements of soft or moderately firm goitres. It is generally useless in the purely cystic variety of the disease, but may give good results in the fibro-cystic forms where there is much parenchyma present. The writer has seen many successes from this treatment in the practice of Sir M. Mackenzie at the Throat Hospital. He has tried it himself in cystic goitres without obtaining the least benefit. Two grains of iodine dissolved in 25 minims of pure alcohol are injected by a hypodermic syringe into the substance of the gland twice a week. Some surgeons prefer to inject 10 to 20 minims of the U. S. P. tincture. The greatest care is necessary to avoid puncture of a large vein, or of the trachea or arteries, and the admission of air must be guarded against.

It is a good plan to compress the superficial veins by tying a piece of tape firmly round the base of the neck, below the tumor, before inserting the needle. The injection should be made very slowly by screwing home the piston, and the needle should never be inserted into the same spot in repeating the injections. As a rule, decided improvement should be visible in six or eight weeks, even in large goitres, though the treatment may be necessary for several months.

Generally pain and some tenderness follow soon after injecting, but they speedily disappear.

Osmic acid, iodide of potassium, ergotine, Fowler's solution, and absolute alcohol have been used, but without any results warranting their selection when iodine is available.

Electrolysis has been tried in fourteen cases by Duncan with the result of six being completely cured. Further experience may prove of great value in this method of treating goitre. Continuous application of cold by means of Leiter's tubes has also given some good results.

When above treatment fails, and the growth threatens to produce suffocation, operative measures of a more serious nature may be imperatively demanded. Tracheotomy rarely will be of any benefit, owing to the nature of the obstruction. Tying of the superior thyroid arteries, with the view of starving the growth, is hardly justified by results.

Jones's operation promises to be valuable. It consists in exposing, isolating, and resecting the thyroid *isthmus*. After tying double ligatures on each side near its junction with the lateral lobes, the isthmus is removed and the wound well drained and allowed to heal up from the bottom.

By this operation, in the great majority of cases, all pressure is taken off the air-passages, and danger to life is averted, and shrinkage of the lateral tumors to a considerable extent generally follows.

Excision or removal of the tumor is a serious operation, but it has been performed many times with complete success. Myxœdema may be a possible result unless a portion of the gland be left behind, and in young subjects cretinism may supervene if the entire gland be taken away.

Removal of the thyroid body by common consent of surgeons should only be undertaken under the following circumstances: *i. e.*, when pain and dyspnœa threaten to cut life short; and it should never be undertaken with the view of simply removing a deformity. When pressure of the tumor causes compression of the trachea, spasm of the glottis, or paralysis of the abductors of the glottis, operative interference must not be delayed. Fortunately, such events are very rare in goitre.

The operation consists in the full exposure of the tumor by one long median incision, and a smaller oblique incision outward and upward on each side toward the sterno-mastoid.

After carefully tying all superficial veins, the thyroid arteries and their veins are ligatured and the tumor reflected and enucleated with the fingers and handle of the scalpel, the isthmus being divided and ligatured before each lateral half of the growth is removed.

Cystic goitre is best treated by Mackenzie's operation of tapping the cyst, injecting 1 to 2 drachms of a watery solution (25 per cent.) of solid chloride of iron through the canula by means of a special syringe designed to prevent the possibility of the admission of air. The canula

is plugged and left *in situ* for seventy-two hours, after which the plug is withdrawn and the contents allowed to flow out. Should the liquid be found to contain blood or to show no symptoms of suppuration the injection is to be repeated, the plug inserted, and the solution permitted to remain for seventy-two hours more. One injection generally is sufficient to establish suppuration, but a second or third may be necessary. After pus appears, the plug being withdrawn and the canula retained, free poulticing should be kept up for weeks. At first, to still further favor suppuration, the plug may occasionally be inserted so as to retain a quantity of pus for several hours. After this, the cavity should be syringed several times a day with tepid water containing an antiseptic like boric acid (10 grains to 1 ounce).

In the subsequent management of the case care should be exercised to prevent the canula becoming obstructed. Hovell provides for this by inserting a piece of Ellis's spiral silver wire drainage-tube into the canula and fixing it there with the extremity projecting into the abscess cavity. When the cyst fails to contract, and the purulent discharge becomes thin and diminished in amount from flabby granulations, the cavity may be daily washed out and a solution of chlorate of zinc (20 grains to 1 ounce) he injected and allowed to escape.

This injection Hovell repeats until he obtains evidence that the granulations have assumed a healthy character.

The canula must be retained in the cyst until its cavity shrinks, and if the granulations block up its extremity a shorter instrument can be inserted.

Multilocular cysts may be treated by puncture and injections made through the original opening.

In treating large cysts, it is advisable not to entirely empty their contents before injecting, as hemorrhage from their vascular walls interferes with the action of the iron.

Iodine and other irritants have been used, but the above treatment is the best for ordinary cases. Small cysts may be dealt with by Porter's method, which consists in drawing off the fluid and inserting several inches of catgut, previously soaked in tincture of iodine. The catgut is allowed to remain until suppuration is established, the canula having been withdrawn after its insertion.

Woakes has recently published some cases of cystic goitre which were cured by the introduction of chromic acid into the cysts after tapping. If subsequent experience establishes this treatment a great advance will be marked in the management of these cases. He introduces the acid upon a special form of instrument, introduced through the canula, and applies it to the walls of the cyst; speedy obliteration of the cavity ensued in all his cases. His paper appears in the *Lancet* of June, 1890.

Free incision of the cyst with suturing of its margins to the skin wound, and plugging of the cavity with cotton wool, soaked in antiseptic or astringent solutions has given excellent results in some cases.

Excision of the cyst in some cases can be done with comparative ease, but in others it is a very formidable operation, and one not to be lightly undertaken.

Exophthalmic Goitre. The treatment of this affection is anything but satisfactory. Innumerable remedies have been reported as "curing" the disease. These remedies in other hands have for the most part been found either to produce no good, or to aggravate the evil. The symptoms are liable to disappear spontaneously or to subside in part for variable periods; this renders judgment upon the value of remedies a matter of extreme difficulty.

Thus iodine has been praised and condemned. Iron has shared the same fate, but it would appear that improvement has been frequently seen to follow the alternate use of mild preparations of iron and the administration of quinine, for periods of about one month each.

Belladonna, arsenic, chloride of barium, ergotine, and digitalis have each some quasi successes recorded in their favor. Veratrum viride has also given temporary relief.

Recently three cases have been reported as cured by the steady administration of 2 to 5 minim doses of strophanthus tincture (1 : 20) four times a day, and sparteine (¼ grain every four hours) has also had an encouraging report. Both these remedies possess the power of markedly diminishing the rapid pulse-rate, which is a prominent feature in the disease. Further trials of their lasting benefits are awaited with interest.

Galvanism of the cervical sympathic and pneumogastric has given excellent results, but no very decided opinion can be formed of the *permanency* of these results in the absence of carefully recorded and closely watched cases. Wolfenden has noticed the curious fact that the electrical resistance of the body is diminished almost to nothing in this disease, a current of a couple of volts passing readily through the body, and deflecting the galvanometer needle.

In applying galvanism to the sympathetic for the relief of exophthalmic goitre, a weak continuous current (not exceeding ten or twelve Leclanché cells) may be used (commencing with half this number). The negative electrode should be placed upon the lower cervical spines, and the positive moved about upon the skin in front of the sterno-mastoid muscles upon each side. The current from four to six cells may be applied to the closed eyelids when there is much exophthalmos.

The writer can report excellent results from the passage of the weak continuous current in this manner in a severe case, which is just now declared convalescent. His late experiences lead him to believe that the only reliable routine treatment will be found to be strophanthus internally, and the continuous current three times a week to the brain and neck. In applying the current to the brain, he places a pad of lint *saturated* with warm water over the closed eyelid. Upon the top of this is placed the ordinary convex electrode.

Sansom employs the continuous current from twenty to forty Le-

clanché elements, placing one pole behind the lower jaw, and the other at the corresponding point on the opposite side, or at the nape of the neck, or just above the sternum. Charcot uses both faradization and galvanism, sending the current from the former through both carotid regions alternately. The continuous current he sends from the nape of the neck through the præcordium at the third left intercostal space. Each sitting lasts ten to fifteen minutes, every other day for six months, when a permanent cure may be expected.

The diet, exercise, free ventilation, periods of rest and sleep must be carefully investigated and errors corrected, and everything calculated to improve the general health and tranquillize the mind should be resorted to. Hutchinson insists upon the importance of a change of air to the sea or a mountainous region.

GONORRHŒA.

Nearly every physician of experience has his own method of treating this disorder. Nevertheless, there are certain broad lines, to travel beyond which is dangerous. Can anything be done to prevent, cut short, or modify the attack in a patient presenting himself to the surgeon during the period of incubation, before any symptoms of the disease show themselves? The old methods of injecting strong solutions of nitrate of silver, and taking large doses of copaiba, are fraught with such danger that they have been generally discarded as abortives, though some surgeons still advocate their use. Astringent injections used at this period are useless, and aggravate the symptoms, which are certain to come on with greater intensity after their use, if the gonorrhœa germs have found their way into the urethra.

The best course to pursue in such a case, if the patient finds he has exposed himself to the infection of gonorrhœa, is to begin washing out the urethra with a very weak warm injection of some unirritating germicide. By far the safest of these is permanganate of potassium. Bichloride of mercury may be more certain in its action, but the writer has never ventured to use it at this stage, as 1 grain of the permanganate in 5 ounces of water, made tepid before injection, answers every purpose with safety. In those cases where this method of treatment fails, the disease when it appears is very mild. The injections to be of use must be thorough and frequent, and when any sign of discharge appears, the quantity of permanganate is to be doubled.

In the acute stage of gonorrhœa great harm is done by the injudicious use of drugs and injections. Rest, when possible, is of primary importance. Diet must be carefully attended to. Milk, with light farinaceous food and eggs, only should be permitted. Animal food, strong tea or coffee, and alcohol in every form, must be forbidden. Smoking is said to be very injurious. The writer has not, however, satisfied himself about this, and, moreover, it is the only solace left to the unhappy victim, who is so often tortured with remorse that his state of mind reacts upon his disorder. Tobacco may be useful as a mild seda-

tive to his irritable and restless state. A sharp saline purge, as 1 ounce of Rochelle or 4 drachms of Epsom salt, should be administered, and repeated daily if necessary.

Warm baths, when convenient or possible, are of value.

Thirst may be diminished by copious draughts of effervescing potash water, to which fresh lemon-juice is added; the citrate of potash so formed being one of the best possible remedies for the irritated urinary surface.

Rarely will aconite, diaphoretics, or febrifuges be called for. But in very acute cases, with much fever and great swelling of the penis in plethoric subjects, a mixture like the following may be given with advantage:

℞.—Antimon. et potas. tart.		gr. jss.
Liq. ammon. acet.		℥ij.
Tinct. aconiti		♏v.
Aquæ camphoræ	 ad	℥vj.—M.

S.—Take a tablespoonful every two hours.

Hot or cold water to the penis, whichever gives most relief, may be tried, and when in the warm bath the patient may try the effects of a warm water injection down the urethra. Unless the case is unusually severe or acute, this will give relief. As much Condy's fluid as will stain the water may be added, though it will be better for the physician to prescribe and injection containing 2 grains of permanganate of potassium in 10 ounces of distilled water to be used every hour. Copaiba and astringent injections are not to be used until the very acute stage is over.

Chordee at this stage is sometimes a very severe symptom. The most reliable treatment is a large enema of *warm* water, after which a suppository like the following may be inserted:

℞.—Ext. belladonnæ (U. S. P.)		gr. ijss.
Morphinæ hydrochlor.		gr. iij.
Pulv. camphoræ		gr. xl.
Olei theobromatis		gr. lxx.—M.

Divide the mass into eight suppositories.

S.—Let one suppository be used at bed-time if the pain is severe.

Bromide of potassium (20 grains), with 5 grains of camphor and 10 grains of chloral, may be given when opium and morphine are contra-indicated. Cannabis indica, henbane, lupulin, ergotin, monobromate of camphor, atropine, tobacco enemata, aconite, and many other remedies are recommended; but camphor and opium meet all requirements. A nitrite of amyl capsule may be used for inhalation, or in very severe cases a 2 per cent. cocaine solution may be injected.

Upon the subsidence of feverish symptoms and the diminution of

pain in micturating and chordee, the stage for internal anti-gonorrhœal remedies and astringent injections has arrived.

Of all internal remedies, new and old, copaiba stands at the head, notwithstanding its disgusting flavor. Capsules do much to mask this, but the odor of the eructations is sometimes very annoying. Emulsions are very liable to upset the stomach. Cubebs may be easily combined with it, though some prefer to give the powdered cubebs alone in milk.

The following is by far the best means of prescribing copaiba:

℞.—Pulv. cubebæ ℥ij.
Pulv. potassii nit. ℥ij.
Pulv. Doveri ℥ss.
Bals. copaibæ q. s.

S.—The size of a hazelnut to be taken in wafer paper, three times a day, two hours after meals.

The following mixture may be ordered:

℞.—Bals. copaibæ ℥vj.
Liq. potassæ ℥iij.
Mucilag. acaciæ ℥j.
Spt. ætheris nit. ℥iij.
Aquæ cinnamom. ℥vss.—M.

S.—Take a tablespoonful four times a day after meals. Shake the bottle.

Santal oil acts like copaiba, and is less likely to be followed by the eruption which sometimes follows copaiba. It may be given in a paste or electuary, in capsules, or in a mixture. Twenty minim doses after meals, three or four times a day, may be administered. It is much less unpleasant and less likely to upset the stomach than copaiba or cubebs.

Tincture of cantharides has been highly recommended in this, and even in the acute stage when there is pain in micturition and chordee; 1 minim may be given every three hours. It is a remedy which the author has never tried and does not intend to try.

Piper methisticum, pulsatilla, buchu, arbutin, benzoic acid, hydrastis, thallin, salol, turpentine, hazeline, Canada balsam, and many other remedies have their admirers and advocates, but the above-mentioned will be found to fulfil all requirements.

Tincture of iron is a drug of unquestionable value in some cases, and it may be given in every case at the end of the balsam treatment, which generally lasts about fourteen to twenty-one days. During the administration of copaiba, cubebs, or santal oil, should any indiscretion in diet or exercise cause a relapse to the feverish chordee, or painful micturating stage, these remedies should be stopped till the acute symptoms pass off.

Locally the stage of free discharge and comparative freedom from

pain is very generally treated by means of astringent injections at the same time that the patient is having the balsam internally. The favorite injection with the writer at this stage, and at *every stage* of gonorrhœa, is the permanganate of potassium; in the early stages, as already mentioned, the solution should be weak ($\frac{1}{4}$ grain to 1 ounce). At the stage under discussion an injection may be ordered containing 1 grain in each ounce of distilled water, with directions that at first it is to be diluted with an equal volume of warm water before injecting. The quantity of water is to be diminished each day until the full strength of the injection is used. All urethral injections should be used tepid or warm, and it will suffice for all ordinary purposes if the patient keep a small bottle of the fluid in his trousers' pocket, where it soon becomes of the same temperature as the body.

The urethra should be first well washed out with a stream of warm water after micturating, when 2 or 3 drachms of the solution should be injected slowly down the urethra, and its return prevented by grasping the head of the penis firmly between the fingers for two or three minutes. The frequency of the injections will depend upon the nature and strength of the solution and the peculiarities of the case. As a rule, it is much better to *inject a weak solution frequently than a stronger one less often.* It is one of the many virtues of the permanganate solution, that there is little danger in overdoing it in this direction. Little or no smarting should follow its use after a few trials, and, if smarting result, the injection should be diluted.

The writer believes that the successful treatment of gonorrhœa by injections depends, upon the whole, much less upon the nature of the injection than upon the skill of using it. He would, thereforo, venture to suggest to the young practitioner the advisability of selecting one drug and adhering to it persistently, varying its strength and altering the frequency of the injections according to the effect desired or produced. By these means he soon becomes master of the remedy, and he will be astonished to find how much he will be able to do with it, and how easily he can alter its effects to suit the constantly changing conditions of the diseased state. The endless varieties of injections tempt the physician to change from one to the other, to the detriment of the patient and to the deterirration of his own experience. This principle applies to every department of treatment, and is one of the secrets of the success of some physicians, whose conservative prejudices have prevented them from trying most of the new and worthless drugs daily written up in the current literature of medicine. The man who is patron of all *drugs* will too often be found not to be master of a single *remedy.*

Bichloride of mercury is an excellent local remedy in gonorrhœa, and, possibly, it is the best of all. The writer has had little experience of it in this disease however, because since he has adopted the practice of using the permanganate, he has scarcely ever found it fail to do all that could be desired of it. The strength of the solution may be

varied to suit the stage and severity of the affection. As a rule, an injection containing ½ grain in 16 ounces of water is a safe solution to begin with. This is 1 in 14,000, and may be injected warm every hour or two hours. In three or four days the strength may be gradually increased until twice this proportion of the bichloride is employed.

The physician can order 1 grain to be dissolved in 16 ounces of water, with directions that this is to be diluted, at first, with an equal quantity of *hot* water, the water to be gradually diminished until the full strength is employed. The salt should not be increased above 2 grains in the above quantity of water (*i. e.* 1 : 3500). It is speedy, safe, and certain in its action, and has been found equally efficacious in the specific and in the non-contagious forms of urethritis.

Salicylate of mercury, 1 grain in 4 or 5 ounces of water, has been greatly extolled.

Sulphate of zinc is by far, the most frequently employed injection in gonorrhœa. It is used in strengths varying from 1 to 5 grains in each ounce of water. The latter proportion is too great for safety, as it is liable to produce pain and aggravation of the symptoms, as well as to induce epididymitis. Any strong solution may bring about this latter complication.

Acetate of zinc (2 to 3 grains to 1 ounce).
Chloride of zinc (½ to 1 grain in 1 ounce).
Sulphocarbolate of zinc (2 grains to 1 ounce).
Carbolic acid (6 grains to I ounce).
Chloral (2 grains to 1 ounce).
Boric acid (10 grains to 1 ounce).
Nitrate of silver (¼ grain to 1 ounce).
Acetate of lead (3 grains to 1 ounce).
Tannin (5 grains to 1 ounce).
Alum (3 grains to 1 ounce).
Creolin (6 per cent.).
Iodoform (10 grains to 1 ounce).
Chloride of iron (1 minim of the strong liquor to 1 ounce).
Decoction of lemons.
Citric and salicylic acids (2 grains and ⅛ grain).
Record's injection of sulphate of zinc and acetate of lead (5 grains each to 1 ounce).
Ichthyol (1 per cent.).

The above are but a few of the many drugs employed for the local treatment of gonorrhœa; the zinc salts are the most satisfactory. The nitrate of silver is objectionable owing to the pain it causes, but in dilute solution it has again become fashionable, and Continental practitioners are using it largely. About 1 grain in 6 ounces distilled water is a good working strength.

As mentioned under gleet, bougies called antrophores, consisting of a solid soluble gelatine basis, containing 2 to 5 per cent. of thallin, the whole enclosed in a fine nickel-plated spiral, are now largely em-

ployed in the treatment of gonorrhœa. They are inserted into the urethra and left *in situ*. Solid bougies, made up of a similar basis and containing iodoform and eucalyptus, are employed in the same way, and nearly every drug mentioned above has been used in this form.

For complications, see under rheumatism, conjunctivitis, orchitis, cystitis, etc.

Gonorrhœa in women is to be treated upon the same lines, and the disease rapidly yields to permanganate solution, 5 to 10 grains to the pint. The only point worth remembering in these cases is that the vagina should be well washed out with at least a quart or three pints of warm water before injecting. As the discharge lessens, sulphate of zinc (1 drachm to the pint) may be used, but upon the whole the best routine treatment will be found in a mixture of equal parts of powdered alum and borax, of which a tablespoonful may be dissolved in three pints of warm water, and injected when nearly cold three or four times a day, after washing the passage out with warm water.

When cystitis supervenes, the remedies mentioned upon page 66 are to be resorted to. Medicated pessaries, containing iodoform, carbolic acid, creolin, resorcin, ichthyol, and other antiseptic are both convenient and efficacious.

GOUT.

The treatment will embrace the management of the case (1) during acute attacks; (2) between the attacks; (3) during the chronic stage. The diet in acute or transient gout should be chiefly liquid, no solid animal food being permitted. After the first day, farinaceous puddings, eggs, weak beef tea, and chicken soup may be given. Concentrated beef essences may be allowed if the attack is occurring in a broken down constitution.

Two systems of managing gout have been tried, one consisting of administering large draughts of hot or warm water, alternating with quantities of weak soup; the other is known as the "dry cure," and consists in the administration of dry food, like hard biscuits, without any liquids at all. Neither exclusive method of treating acute gout has been followed by results justifying further trial. Where the attack is occurring in a young or middle aged strong subject the aim should be to feed him upon as low a diet as possible consistent with safety, milk, barley-water, weak arrowroot, toast and water being given freely. In those of weak constitutions, the aged, and those who have suffered from previous attacks, this treatment must be modified considerably, a fairly generous allowance of food being given with as little nitrogenized element as possible.

Stimulants must, unless in very exceptional cases, be forbidden. In the presence of debility or intemperate habits, alcohol in limited amount is called for, and then wines of all kinds are contra-indicated. A moderate quantity of good old whiskey is by far the most suitable stimulant in these exceptional cases. Next in value to it will come

good brandy and pure gin, and the stimulant should be combined with the food, whiskey or brandy and milk making an acceptable beverage, while gin may be given after food with an effervescing liquid.

As the attack passes off the diet may be improved, fish, fowl, oysters, and vegetables being permitted.

Medicinal treatment at this stage will consist of one smart saline purge and the administration of colchicum. About the value of this drug in gout much has been written, and many strongly insist upon its numerous bad qualities, and affirm that it should never be given, as it causes the disease to return and show itself in worse forms, and that its administration is liable to cause the mischief to fly from a safe region to a vital organ, etc. Garrod, Yeo, Roberts, Bartholow, and, indeed, most of the best modern authorities, recommend the remedy as a specific, and there cannot be any danger in using it in moderate doses under strict and close surveillance.

There are several methods of administering colchicum in acute gout. All authorities agree in one point—viz., that purging by the drug is not necessary, and that vomiting caused by it is highly objectionable. It is never advisable to produce the physiological effects of the drug in treating this disease. Called to a patient in an attack of gout, 25 minims of the wine may be given at once, and 8 minims every four or six hours afterward. It will be safer to give 15 minims at first, and 5 minims every hour for six or eight doses until pain is relieved in very smart attacks. The drug may be given with advantage in combination with alkalies, or in effervescent mixtures containing bicarbonate of potash, which can be given with lemon-juice or as the white mixture.

℞.—Vini colchici ℥iij.
Magnesii sulph. ℥j.
Magnesii carb. ℥ij.
Aquæ menth. pip. ad ℥xij.—M.

S.—Take half a wineglassful every four hours. Shake the bottle.

Where there is much prostration, saline purges and the above mixture are contra-indicated. In such cases a dose of rhubarb and colocynth pill, or ¼ grain of podophyllin, may be given with advantage.

Opium, chloral, and morphine may be used for the relief of acute pain. If possible, it is better to avoid these remedies and trust to local treatment, but where the agony is intense the hypodermic injection of morphine must be resorted to. Hyoscyamus, belladonna, or atropine will generally prove of little value.

Where diuretic and diaphoretic action is required—viz., where there is a scanty quantity of urine and a hot, dry skin—the colchicum may be replaced by 3 grains of citrate of lithia in 5 ounces of potash water and a little lemon-juice every hour for four doses, then every

two or three hours. Elimination of uric acid by this means is speedy and beneficial.

Sleeplessness is best relieved by 20-grain doses of sulphonal or large doses of the bromides.

Salicylate of soda has of late years been much used in the treatment of gout, instead of colchicum, and it has been demonstrated that it assists the elimination of the excess of uric acid in the blood, it diminishes fever, and relieves pain. It may be given in doses of 30 grains at the beginning of the attack, and repeated every four hours in half this amount. The writer has seen most satisfactory results from its administration in acute gout.

The local treatment of acute gout resolves itself, for the most part, into the use of remedies for the relief of pain. In those cases where the pain is "bearable," the best course to follow is to place the affected joint in a position of absolute rest, surround it with thick layers of warm and dry absorbent wool, covered in by a piece of thin mackintosh, the whole being evenly and lightly bandaged, and placed upon a pillow in a slightly elevated position. The wool should be changed every twenty-four or forty-eight hours, and a fresh, dry, warm supply applied.

Leeching invariably does some mischief. Poulticing is also objectionable, and cold lotions or compresses may cost the patient his life, and arnica never should be employed. The application of a strong solution of nitrate of silver appears to act beneficially only by substituting one form of misery for another. A very hot foot-bath of warm fomentation of poppy capsules and chamomile flowers gives some relief. A piece of flannel wrung out of hot water and sprinkled over with liniment of belladonna or aconite may be tried. These liniments or chloroform liniment may be applied upon lint and covered over with oiled silk, or the joint may be smeared over with the extract of belladonna rubbed into a cream with glycerin. Veratrine or aconitine ointments, oil of peppermint, tobacco leaves, lotions containing cocaine, chloral, iodide of potassium, iodine, salicylates, lithia salts, cajuput oil, iodoform, alkaline solutions, solutions of morphine and atropine (2 grains and 1 grain to each drachm), spirit lotion, and ether and water, have been used with various intentions and varying successes.

Blisters have been used. Their beneficial effects are best seen in some cases of chronic or irregular gout.

Where the attack is interrupted by the appearance of symptoms characteristic of *suppressed*, *retrocedent*, or *irregular* gout, the principles embodied in the previous remarks are to be carried out. The first point to attend to in such cases is to induce a rapid and immediate elimination of the poisonous material in the blood by the kidneys, skin, bowels, or certain joints or tissues. Colchicum must be used in such cases with unusual circumspection, purely eliminatory treatment being more reliable. Symptoms of collapse following the invasion of the vital parts, as the heart, nervous system, or stomach, must be met by

general stimulants and free counter-irritation of joints which have been known as the former local indicators of gout. This can be done by very hot fomentations with mustard and water, turpentine stupes, cayenne, liquid blisters, or local or general hot packs.

The treatment of the disease during the intervals between the attacks, or in the period succeeding a first attack of gout, should be directed to the prevention of further attacks or the prolongation of the intervals, and the removal of local remnants of former joint troubles.

With these objects in view, every surrounding and habit of the patient's living must be inquired into and scrutinized, and the most rigid rules laid down for his guidance, especially should he be the victim of a strong hereditary tendency.

Everything that can possibly increase the abnormal formation of uric acid in the system is to be forbidden or corrected, and every measure which in any degree increases, stimulates, or assists in the elimination of this product after its formation is to be encouraged.

Diet, next to heredity, is the most potent factor in producing gout. Conflicting opinions prevail upon the advisability of eliminating certain articles of food, but all authorities are at one in condemning general gourmandizing or excesses in eating. The very large surplus which the majority of mankind pushes down the throat over and above what is really necessary to maintain life is not to be cut completely off, but the victim of gouty tendencies is certainly called upon to very materially diminish this surplus. Obesity is what he should dread, though he may partake of fat and butter freely.

Animal food in ordinary amount is condemned by most writers. This is certainly a mistake, as it is curtailed in the ordinary dietary for gout to make way for a larger than usual amount of farinaceous and starchy material, which is decidedly more objectionable than butchers' meat. Underdone roast meat and steak or chops may be freely allowed, while fish and poultry are unobjectionable.

The accessory dishes are the source of danger to the gouty. Pastry, sugar, puddings, entrées, pork, game, sweets, fruits, and especially starches, are to be avoided. According to Draper, the cardinal feature in the gouty diathesis is the feeble capacity for the digestion and assimilation of carbohydrates and their derivatives, and this affords the guiding principle for the regulartion of the gouty dietary.

Some physicians, looking to the dangers of the formation of uric acid from a purely nitrogenous or meat diet, exclude it entirely, and the patient turns to a food chiefly made up of starches. Both extremes are very objectionable, and of the two, probably the starchy diet is the more objectionable, though the writer has witnessed serious results from the Salisbury diet of beefsteaks and hot water. Milk, butter, cream, fats, cheese, and vegetables in fair amount, and celery and salads may be freely permitted. Potatoes are objectionable. Water should be very freely used as a beverage.

About wines, beer, and all fermented liquors, there can scarcely be

a doubt that all are objectionable, and should be strictly avoided. It will, however, be found that this rigid rule will be resented by most patients, and it becomes the painful duty of the physician to express an opinion about the *least* objectionable member or members of this group. This is no easy matter. Although all authorities condemn the entire group, nearly every one of them is permitted as the least objectionable tipple by *some* authority.

Thus, good old port is even advocated by some physicians. Roberts says that "the most suitable are good claret, Hock, Moselle, Chablis, or Sauterne, and good dry sherry suits some gouty patients well." The writer has seen this latter wine, "good and dry," become the sole cause of bad gout in a patient who never took any other form of stimulant. It is almost better to insist upon all and each of these being decidedly injurious, and leave the responsibility of nominating his own poison to rest upon the unfortunate victim. Poor human nature soons twists the doctor's opinion of "least objectionable" into a decided "permit," and excess is the common result.

Where an alcoholic stimulant is deemed necessary, there can be no doubt about the best. Whiskey, brandy, or gin, *well diluted* with an alkaline effervescing water, and always given along with or immediately after food, is, from the gouty point of view, almost free from objections.

In gouty patients sometimes one excess in the use of fermented liquors will bring on an attack, and in some an attack may follow one excess in eating. The lesson to be enforced, therefore, is temperance in all things. Some authorities insist upon the fact that it is the quality, and not the quantity, which is injurious. There is no doubt that inferior wines are poisonous to the gouty patient, who can *sometimes* indulge in really good wine without suffering from it.

Exercise comes next in importance to diet as a factor in the treatment of gout, though if the writer judged entirely from his own limited experience in gout, he would say that he has observed much more mischief to follow want of muscular exercise than to supervene upon errors in diet. Free open-air exercise (the best form being smart walking) should always be insisted upon. It should be pushed to the extent of fatigue, and one long walk, ending in moderate "tiredness" and a fair amount of perspiration, is a daily remedy of great efficacy in the treatment and prevention of gout. Mere moving about in the open air, as most members of the upper classes do, will not suffice, and the class of patients generally afflicted with gout do not relish smart walking. If the patient be not too old, he should be advised to try an outdoor game, like golf.

Horse exercise is very beneficial, and may be freely indulged in by those whose physical condition permits of it.

Indolent habits are to be given up, early to bed and early to rise being the motto. Many instances are to be met with where confirmed gout in middle-aged subjects, which had resisted all treatments, has

disappeared upon some reverse of fortune which necessitated the abandonment of all luxurious habits, and compelled the victim to lead an active and useful life. Freedom from worry or excessive brain strain is desirable; but honest, hard work, mental or physical, is a good antidote. It is, of course, impossible to carry out these principles in chronic invalids suffering from gouty joints and other locomotive disabilities. For them massage is a boon if persistently employed.

Sea or cold bathing for the vigorous, or wet packs daily for the crippled are highly beneficial. The Turkish bath is to be recommended with caution. Change of air is beneficial if carried out with judgment, a dry, warm, or temperate atmosphere suiting most cases in the winter, the sea being avoided, especially where there is a tendency to skin troubles. Many resorts are sought out by gouty patients where a course of alkaline mineral waters can be had; of these the best is Carlsbad. The great value of drinking of warm alkaline water has been long recognized in its property of preventing attacks and of removing renal, hepatic, and nervous disorders resulting from gout. In the opinion of most competent authorities as Garrod, Ebstein, Le Clerq, etc., the alkaline mineral waters exert their beneficial effects through their action upon the liver and alimentary canal. The Carlsbad gout cure embraces more than merely sipping the water; exercises, bathing, diet, and other matters are carefully attended to. At home, Bath, Cheltenham, Leamington, Buxton, Harrogate, and Strathpeffer may be advocated, and the baths, with the internal use of the waters, tried for some months.

Kissingen, Vichy, Homburg, Royat, Baden-Baden, Wiesbaden, Nauheim, and Aix-les-Bains are favorite resorts for gouty patients who do not mind the journey.

The waters imported from many mineral springs are in constant use, and the best of them are Friedrichshall, Hunyadi Janos, and Vichy. Contrexville water, to be of use, must be taken as it is at the spring in very large doses. About one gallon per day is not a very high average amount for the gouty or calculous patient to consume. Sir W. Roberts has stated, as one of the conclusions from his valuable researches on gout, that a patient verging upon an attack of gout should not take mineral waters rich in soda or lime.

The medicinal remedies available in the treatment of gout, either with a view of preventing attacks or of removing local manifestations of the disease, will embrace the use of remedies whose action will be chiefly exerted upon the eliminatory organs.

Alkalies, by forming soluble salts with uric acid, which salts acting as diuretics, are freely washed out in the urine, cause marked elimination of uric acid, and are the most valuable of gouty remedies.

Potash salts in full doses (20 grains of the bicarbonate four times a day or of the citrate) are preferable to the corresponding soda

salts, because the urate of potash is more soluble than the urate of soda.

Lithium forms very soluble salts with uric acid, and is much valued as a remedy in the subacute attacks of gout.

Carlsbad salt and other alkaline springs act in the same way.

Salts of the alkaline earths act in a similar way, and the lime and magnesium waters are much prized by some physicians.

Disorders of the stomach, liver, bowels, and kidneys are to be met by appropriate treatment directed to these organs.

Salicylic acid, or the soda salt, is given with the view of assisting in the elimination of uric acid. Very divergent views are expressed upon the subject. Germain Sée, Lecorché, Lathum, and others testify to its great value either as a means of causing elimination of uric acid, or as a powerful remedy capable of preventing the formation of uric acid in the system.

Though it does not appear to really cut short or cure the disease, it is of great value in relieving the urgency of many of the symptoms, especially the cardiac and pulmonary distress. The proper indication, therefore, for the exhibition of salicylates would appear to the writer to be during the attacks of acute or chronic gout, and not in the intervals.

Benzoates, either in the form of benzoic acid or the benzoates of sodium and lithium, have been much used as preventives or cures for gout. Beyond their diuretic action, there is not much encouragement to be found in perusing the clinical reports of cases where they had been extensively tried.

Phosphate of ammonia is a remedy of very considerable power in preventing attacks of acute gout, and if given in doses of 10 to 20 grains for long periods in solution, well diluted, it is of great benefit in chronic gout. Haig insists upon the great value of a course of *pure* phosphate of soda in the chronic forms of gout, and in the intervals. Chloride of ammonium acts in much the same way. It is indicated in the intervals between the attacks of acute gout, especially where neurotic troubles remain as evidence of the presence of uric acid still in the system.

Iodide of potassium is of great value in chronic gout, or in the intervals between acute attacks. When there are renal or vascular complications there is no remedy to equal it, and it is also of great service in the treatment of local joint trouble in the chronic forms of the disease. The writer has given it in such cases with benefit, combined with alkalies and a small amount of colchicum.

℞.—Potassii iodidi ʒij.
Potassii bicarbonatis ʒvj.
Vini colchici ʒij.
Aquæ camphoræ ℥xij.—M.

S.—Take a tablespoonful in a wineglassful of water, three times a day after meals.

Free iodine has been much praised by some practitioners, but it has not found much favor.

Guaiacum may be used with advantage in doses of 5 grains three times a day. It is indicated in the more chronic forms of the disease where the painful condition of the joints appears to be almost constant. Garrod speaks in the highest terms of it in such cases. Where the affection closely simulates chronic rheumatism it is most useful. The Chelsea pensioner (see author's work on *Materia Medica and Therapeutics*, fifth edition, page 430) is a famous electuary, containing in addition to guaiacum, sulphur, rhubarb, mustard, and nitre. It may be given in doses of one teaspoonful morning and night.

In chronic gout the disease has become so thoroughly established that when the patient is not suffering from subacute attacks, he is groaning under constant complications of an arthritic, renal, neurotic, asthmatic, cardiac, or cutaneous nature, which may render life almost unendurable. The guiding principles for the treatment of such cases are those just discussed. Diet, exercise, baths, alkaline waters, purgatives, colchium, iodides, alkalies, change of climate, benzoates, guaiacum, arsenic, iron, tonics, massage, warm clothing, salicylates, etc., are to be carefully weighed, and their proper and judicious selection decided upon the special features of each case. Treatment directed to the local troubles, or complications, is to be based upon the general principles mentioned under the heading of the part affected. The two great points in treatment of every stage of gout are to be emphasized here, viz., *diminished formation of uric acid and increased elimination.* The latter consideration will suggest the closest attention to renal functions. The concretions of urate of sodium existing in the neighborhood of joints are not to be lightly meddled with. Since they are for the most part isolated from the blood by non-vascular tissues the ordinary remedies used for their removal as alkaline lotions, weak electric currents, liniments, friction, massage, blisters, etc., are seldom of much use. Unless when interfering considerably with comfort or the action of joints, the limb may be best treated by continuous, dry warmth. Where a necessity exists for their removal, the skin may be incised and the mass turned out. This is seldom necessary. Edison, of New York, has demonstrated that gouty concretions may be diminished to a remarkable extent by the application of electrical endosmosis.

For the most scientific and comprehensive account of the treatment of the uric acid diathesis, the reader is referred to an address delivered by Professor Burney Yeo before the section of therapeutics, under the presidency of the author, at the meeting of the British Medical Association in 1887. The address and discussion following are published in the *British Medical Journal* of January, 1888.

GRAVEL—See Stone in the Kidney and Stone in the Bladder.

GRAVES' DISEASE—See Goitre Exophthalmic (page 287).

GUMS, Spongy—See Stomatitis.

GUNSHOT WOUNDS—See under Wounds.

HÆMATEMESIS.

The majority of cases will be found to be associated with gastric ulcer, and the question is dealt with in speaking of Gastric Ulcer (page 274). Absolute rest in the horizontal position, and physiological rest to the stomach, as far as possible, should be maintained. Ice, swallowed in small pieces, should be the only substance permitted to enter the stomach. In severe cases, stimulants, food, and even medicines must be administered by the bowel.

Externally, iced compresses in thin subjects, and dry cups and smart sinapisms, where the abdominal walls are thick, may be employed in severe cases. Hot foot baths, with or without mustard, tend to diminish hemorrhage by acting as revulsants.

Opium or morphine, given as a suppository or by hypodermic injection, arrests peristaltic action in the stomach, allays nervous excitement, and calms the circulation, putting the patient into the most favorable conditions for recovery. A little morphine (¼ grain) may be placed upon the tongue and washed down with a teaspoonful of iced water, but, as a rule, it is well to avoid administering drugs by the mouth except in urgent cases, as their presence often aggravates, by exciting increased peristalsis and vomiting.

Where it is decided to give hæmostatic remedies, ergotine may be administered, subcutaneously, in the form of the hypodermic solution (1 : 3), in doses of 10 minims every three or four hours.

Where these measures fail, styptics may be tried by the mouth, and the following may be used. They are enumerated in the probable order of their merit.

Tannin, given dry in wafer paper or in solution, 10 grains in iced water every two hours.

Chloride or nitrate of iron or sulphate of iron. The weak solution of the chloride, in 30 minim doses in iced water, is the least objectionable.

Acetate of lead, in doses up to 5 grains, may be administered in solution every two or three hours in severe cases. It is useless to order it in the pilular for hemorrhage from the gastric membrane; and acetate of lead, when given in the form of pill, should always be freshly prepared, as it is liable to become hard and insoluble when kept in the pilular form for any time.

The following is a useful formula for gastric or pulmonary hemorrhage:

℞.—Plumbi acetatis ʒj.
Acid. acetici dil. ʒjss.
Morphinæ acet. gr. jss.
Aquæ dest. ad ℥viij.—M.
S.—Take a tablespoonful with a little water every two hours.

Alum, in 10 grain doses in solution every thirty minutes, sometimes proves successful. In large doses it is emetic.

Gallic acid may be tried in doses of 5 to 10 grains, and some believe it to be more efficacious than tannin; this is not likely. It may be combined with sulphuric acid with advantage. Hæmatoxylon, krameria, kino, and the entire list of vegetable astringents containing tannin, have been from time to time recommended, but they possess no advantages over the active principle, and are, moreover, more likely to cause vomiting.

Nitrate of silver in one large dose (1 grain in *fresh* pill) may be tried.

Vinum ipecacuanhæ has been extolled in 1 or 2 minim doses. It probably would be equally efficacious if applied externally to the skin of the abdomen in the same heroic proportions.

Creasote, in the capsular form, has checked, for the writer, small hemorrhages in a very satisfactory manner.

Where the hæmatemesis is the result of congestion, caused by hepatic disease, a large dose of sulphate of magnesia or calomel, followed up with ice and revulsive measures, will be advisable. Watson's treatment was 5 grains of calomel at night, and 2 ounces of black draught in the morning.

Hamamelis and chloride of ammonium, alone or combined with any of the previously mentioned styptics, may be tried in such cases.

Stacey Wilson has drawn attention to the part played by varices of the œsophagus in producing hemorrhage in cirrhosis of the liver and other affections. He dwells upon the importance of securing rest to the gullet by prohibiting even the swallowing of ice, and he points out the uselessness of ergot, which probably drives the blood from the arterial system into the dilated varicose veins. Nitrite of amyl, he thinks, might act in the opposite way by drawing a large amount of arterial blood into the capillaries.

Where the hemorrhage appears to be owing to a blood condition, as in purpura, turpentine, in mixture or capsules, along with ice and iron, affords the best hope of success.

See the action of the various agents used in internal hemorrhage, mentioned under Hæmaturia, page 307.

HÆMATIDROSIS.

For the treatment of this rare and interesting condition of "bloody sweating" nearly every hæmostatic has been recommended. The cases have occurred so infrequently, and tend to get well if let alone, so that little can be said about the value of remedies.

As a rule, in vicarious cases, revulsive treatment by hot foot-baths, sinapisms, and saline purgatives should be tried. Many of the cases occur in healthy individuals, and should not be interfered with.

HÆMATINURIA, or HÆMOGLOBINURIA.

In the non-paroxysmal variety, where the urine remains during the illness constantly charged with the coloring matter of the blood, without the presence of any blood corpuscles, the treatment will embrace the remedies suitable to combat the *causes* of the disease. These are the ingestion of poisons, the most important of which are chlorate of potassium, carbonic, pyrogallic, sulphuric, hydrochloric, and carbolic acids, the poisons producing scarlet, typhoid, and other fevers, and the conditions of the blood following severe burns, fat-embolism, scurvy, etc.

Paroxysmal hæmatinuria has a spontaneous tendency to complete recovery in all cases, and it is therefore doubtful if the many remedies said to be beneficial have the slightest influence over the condition.

Quinine and arsenic appear to have some effect upon the urine, and the former remedy in 5 grain doses has been observed to stop the paroxysms in several cases, and in some instances they never returned afterward. Cinchona, in doses of 2 drachms of the compound tincture, has been used by Sir W. Gull with satisfactory results.

Iron in large doses of the astringent preparations, or of the syrup of the iodide, or of the sulphate with sulphuric acid, has been said to be valuable.

Tannic and gallic acids, iodide of potassium, alum, chloride of ammonium, mercurials, vapor baths, dry cupping over the loins, with copious hot drinks containing a little alcohol, and many other remedies suitable in hæmaturia, have been recommended.

HÆMATOCELE.

The treatment of hæmatocele will be based upon the principles guiding the treatment after hemorrhage into internal parts. Thus, hæmatocele of the tunica vaginalis in the early stage will consist in putting the patient to rest in the horizontal position, lying upon his back, with a small light board placed across the upper part of the thighs. Upon this board or splint, as upon a shelf, the enlarged scrotal tumor is laid. Iced compresses, or ice tied up in gutta-percha tissue, is placed over it, or evaporating lotions upon lint are applied. Over all a cradle is placed, covered by the bedclothes, which should be light.

A smart saline, as 1 ounce of Rochelle salt, in a tumblerful of aërated water, may be given. Leeching is rarely productive of good. When a hydrocele had previously existed before, the amount of effused blood will rarely be so great as to cause the tumor to solidify; and even in cases where no effusion had previously existed, the tumor may remain fluid. Tapping with an ordinary trocar and canula is the best practice in such cases, but the surgeon should wait and satisfy himself that absorption is not likely to take place before he resorts to tapping. The operation may be repeated at intervals, with a fair prospect of cure.

Where the tumor remains hard and tense, the best procedure is to make an incision through the skin, and by dividing the deeper layers carefully upon a director, there will be no danger of wounding the testicle, which is often placed in the front part of the tumor. The contents of the sac should be turned out through the large incision made into it, and after syringing, plugs of cotton wool soaked in weak corrosive sublimate solution may be inserted, and the sac left to granulate from the bottom. The same treatment should be adopted in fluid cysts when suppuration sets in, and it will often be advisable in such cases to insert a rubber drainage-tube after turning out the suppurating contents.

In very chronic cases, where the sac walls are much thickened, after the free incision there may be difficulty in detaching the layers of partially organized clot. In such cases a portion of the thickened wall may be removed, or, as Gould recommends, the entire mass, including the testicle, may be excised.

The same measures may be employed in dealing with hæmatoceles of the cord and of the testicle proper—*i. e.*, rest, cold, tapping, or free incision, followed by antiseptic or iodine injections.

Hæmatocele (pelvic) is a grave affection, and may cause death from shock, unless prompt measures be adopted. The writer once witnessed such a seizure take place in his presence, a patient who was perfectly well a few moments before being stricken down, as if shot by a rifle bullet.

The patient should be rapidly undressed and placed on her back upon a hair mattress, with the pelvis slightly raised by a hard counterpane folded neatly and placed under the buttocks. Collapse may be met with stimulants, such as ether, alcohol, or sal volatile. Opium is the only reliable hæmostatic and restorative in such cases, and in the presence of great pain it may be given fearlessly. Small doses are useless; 45 minims of laudanum by the mouth or anus, or ½ grain of morphine by hopodermic injection, should be administered as soon as possible, and the effect kept up by smaller doses, repeated every hour, according to the urgency or severity of the symptoms. In the intervals between the doses of opium brandy and ice may be freely given; afterward brandy or whiskey in *small* quantity, diluted with iced milk, will constitute the best feeding during the early days following the seizure. As soon as possible alcohol should be stopped altogether. Local treatment should consist of cold compresses or crushed ice, folded in gutta-percha tissue or oiled silk, and laid over the lower parts of the abdomen. The vagina may be packed with ice in desperate cases. At this stage some recommend brisk purging with calomel, croton oil, or strong salines. The writer has never had the courage to try these heroic remedies. Nor has he ventured to recommend tight abdominal bandaging. A large sinapism over the anterior surface of the abdomen may be employed as a revulsive measure where the collapse will not permit of iced compresses.

Cases with the gravest aspect generally recover if kept absolutely at rest and under the influence of opium, and meddling by making repeated examinations and explorations is to be condemned. Many remedies may be tried with the view of arresting the internal hemorrhage, of these ergot is the only one likely to prove of much use; it may be given hypodermically, or by the mouth in full doses. Gallic or tannic acids, digitalis, turpentine, acetate of lead, iron, etc., may possibly only tend to divert the physician's mind from the administration of opium, which after all is the remedy upon which the patient's salvation depends.

In the face of a rapidly increasing internal hemorrhage, the operation of opening the abdomen and securing the bleeding vessels may be weighed. If extra-uterine gestation or an ovarian varix is diagnosed this will be justified, but the hope of securing the vessels, from which an ordinary pelvic hæmatocele is fed, is indeed visionary, and the vast majority of cases so treated would probably have their chances of recovery sadly minimized by such an attempt.

The subsequent treatment will be that of peritonitis, pelvic cellulitis, or pelvic abscess. When the shock and collapse have passed away, the resulting peritoneal mischief will call for sedative measures constitutionally and locally. Opium should be still our mainstay, and until all danger of further hemorrhage has passed away cold compresses are to be preferred to hot poultices. These local anodynes are invaluable at a later stage when pelvic cellulitis is established. Iodide of potassium, or mild mercurials, may be given with the view of causing absorption.

In the great majority of cases the effused blood will either become absorbed or an abscess will form which, if left alone, will find its way into the bladder, bowel, vagina, uterus, or through the skin. The practice of puncturing the tumor through the rectum or vagina is followed by some surgeons, there cannot be a doubt that such a routine practice is a serious mistake. When there is evidence that suppuration is already established, and the symptoms and signs lead one to believe that there is danger of the sac bursting into the peritoneal cavity, if a bulging soft point is felt in the vagina or rectum, to wait for spontaneous rupture might be a fatal blunder. The aspirator should be discarded and a large trocar and canula, such as is used for puncturing the bladder, may be selected, and the canula should be driven well home after the withdrawal of the trocar. Should the contents of the cavity consist of coagula, as well as puriform fluid, the opening should be freely enlarged, and the sac well washed out with warmed solutions of corrosive sublimate, or Condy's fluid, injected from time to time through the ordinary enema apparatus, to which a large, soft catheter may be attached. Vaginal puncture is to be preferred to the anal, other things being equal. Tait has successfully operated upon several suppurating hæmatoceles by abdominal section.

HÆMATOMA.

Whether the extravasation of blood takes place under the skin over soft parts, under the skin, aponeurosis or fibrous membrane covering the cranial bones, or between the cartilage and the perichondrium, as often occurs in the ears of lunatics, the treatment is the same. The general principles which guide the surgeon in treating an hæmatocele maintain here also—rest to the injured part, the application of cold lotions or iced compresses in the earlier stages, and afterward the influence of local remedies calculated to promote absorption of effused products. Poultices, aspiration, puncture, and incision should not be resorted to unless there be clear evidence of suppuration having taken place, as the natural tendency in the great majority of cases is for resolution to occur spontaneously. Pressure by bandaging or strapping is a valuable method of assisting Nature in chronic or slowly progressing cases, and sometimes it may be found advisible to apply pressure over a spirit lotion covered in by a layer of oiled silk. The worst forms of caput succedaneum, and the rarer and more serious cephalhæmatomas, will almost invariably yield to expectant treatment.

When suppuration occurs, aspiration is generally advised. It will be found much more satisfactory to make a *free* incision into the centre of the swelling, press out the contents, and wash out the cavity with weak sublimate solution (1 : 5000), or swab it out with lint soaked in strong carbolic acid or iodized phenol, and leave in a drainage-tube under antiseptic dressings.

Hæmatoma auris, if let alone and protected from injury, always yields to expectant treatment, and rarely requires incision, lotions, poultices, or pressure.

HÆMATURIA.

It is useless to attempt to treat this condition until the source and cause of the hemorrhage are determined. Though this may in some cases be found difficult or impossible, nevertheless the first step should be to test the urine microscopically and chemically, investigate its color, reaction, and appearance immediately after micturition and upon standing, and to carefully examine the shape, diameter, and color of all clots by causing them to float in water.

By examining the bladder with the electric lighted cystoscope, the exact site of the hemorrhage may be demonstrated with precision.

A careful analysis of the history and symptoms in many cases will show whether the blood is urethral, vesical, or renal.

Having made the diagnosis of the exact source of the hemorrhage, treatment may then be directed to the disease of which it is the symptom. If from the urethra the passage of as large a sound, catheter, or even rubber catheter, as the canal will admit, should be performed, and pressure made from without by bandage, or strapping, and ice.

If from the bladder and the cause cannot be immediately removed

(stone, ulcer, cancer, tumor, etc.), rest in the horizontal position, and the free use of ice or cold in the rectum, vagina, perineum, or over the pubes. Leiter's tubes may be applied to any of these regions with advantage. Should there be evidence that the hemorrhage, though vesical, is probably vicarious, as may be met with in cases of hæmorrhoids, or suppressed menstruation, the hæmaturia should not be interfered with until the suppressed flux is suppressed. In such cases leeches may be applied, and smart purges administered. Notwithstanding rest and the free application of cold and ice, and the use of the internal hæmostatics to be immediately mentioned if the hemorrhage should continue, resort must be made to vesical injections.

The most efficacious and the safest is iced water containing in solution, alum 25 to 40 grains in each pint. The use of vesical injections will end in disappointment if the bladder be not first emptied with a large-eyed catheter of soft rubber connected with a clover or ordinary lithotrity suction apparatus before their introduction. This plan will be imperative if retention of urine from clots exist.

Other hæmostatics are injected: nitrate of silver (10 grains to 20 ounces), hazeline (1 to 2), solution of chloride or nitrate of iron (1 drachm to 20 ounces). The writer has treated vesical hemorrhage in one case by the injection of castor oil in quantities of 2 to 5 ounces successfully.

Harrison treats severe hæmaturia from enlarged prostrate by emptying the bladder, and tying in a soft catheter, while pressure is made from without as in the case of post-partum hemorrhage. As long as the bladder is capable of exercising pressure there is little danger in these cases, but when from atony of its walls it is unable to contract completely the above means is the only way to stop what may become a fatal hemorrhage.

Internal hæmostatics may be employed at the same time as the injections are being administered.

When the hemorrhage is of renal origin, cold, by means of ice-bags or Lieter's tubes, applied to the loins may be tried.

If the bleeding be the result of the ingestion of irritants like cantharides or overdoses of turpentine, these drugs should be discontinued.

Rest in the horizontal position is even more imperatively demanded than in the management of vesical hemorrhage.

Where the hemorrhage is the result of a general renal congestion, dry cupping of the loins, hydragogue cathartics, strong sinapisms, or local wet packs or mustard packs may be tried. These are indicated in the treatment of hæmaturia coming on in the early stages of acute Bright's disease where the application of cold is fraught with some risk. Such cases, however, seldom require treatment for the hemorrhage.

Internal hæmostatic remedies may be employed where the quantity of blood coming from the vesical or renal region is such as to weaken the patient. Foremost amongst these remedies comes opium or mor-

phine; it may be freely given where the kidneys are not diseased. Its use in Bright's disease is unsafe.

Ergot may be given in large doses in all cases unless pregnancy should chance to be a complication. Hypodermic injections of ergotine (5 grains) may be injected deeply into the buttock, or loin.

Some surgeons prefer sclerotic acid (1 grain). It is a substance of variable composition, and has no advantages over ergotine.

Alum is a safe remedy in these cases, and may be pushed short of producing nausea.

Gallic and tannic acids, rhatany, kino, catechu, matico, and cinchona may exert some influence.

Acetate of lead (3 grains with ½ grain opium) every three hours, and large doses of the astringent iron preparations well diluted, are more certain in their effects and are valuable where purpura exists.

Turpentine (5 minims) or creasote (2 minims) are still more likely to produce some effect upon the hemorrhage.

Digitalis has occasionally given good results, and so has Indian hemp in an unexpected manner; but both are very uncertain in their action.

Hamamelis is lauded, but the writer never saw it do any good, and chimaphila seems to rest upon an equally undeserved reputation.

The best results that the writer has witnessed in the treatment of renal hemorrhage he has obtained by jaborandi in doses of 30 to 45 minims of the tincture (1 : 4). He was led to employ it in hæmaturia after noticing its effects upon bloody urine when given in Bright's disease, with the intention of producing sweating and elimination of urea. He has satisfied himself about its great value in most of the forms of renal hemorrhage from various causes. He hesitates to add another to the long list of substances used to check hemorrhage from the urinary surface, but the action of the entire list is uncertain and generally disappointing.

HÆMOPHILIA.

This being a congenital condition or a diathesis handed down by hereditary transmission, it cannot be expected that treatment by drugs will alter the condition of affairs to any appreciable extent. Everything that will raise the standard of health and maintain it at its greatest height will be needful. Good food, healthy clothing, abundance of ventilation, free open-air exercise and outdoor occupation, freedom from worry and pressure, a warm climate, and very regular habits may do much to modify the diathesis.

Preventive treatment in the way of avoiding injuries, wounds, abrasions, etc., must be a life-long object of care and solicitude. No surgical operation should be undertaken. Many deaths have followed the skilful extraction of teeth, and serious results have followed the most trivial scratchings.

When bleeding has already occurred the treatment is most difficult,

and very firm pressure and styptics may be promptly tried and may succeed in staving off danger. Absolute rest in bed is essential, and internal hæmostatic remedies must be pushed to the extreme. Iron, lead, turpentine, ergot, alum, tannic and gallic acids, creasote, and digitalis may be tried. Iron is the best of these remedies, and Dr. Harkin has recorded good results from the combination of chlorate of potassium (5 grains) and tincture of iron (20 minims) four times a day in glycerin and water. Sometimes, after the failure and discontinuance of all remedies, the hemorrhage ceases when death is expected, and the patient makes a tardy recovery.

Where the hemorrhage proceeds from the socket of a recently extracted tooth the cavity should be packed with cotton-wool soaked in the strongest solution of the chloride of iron, and a pad of the wool placed over the depression or gap in the dental arch and the jaws firmly bandaged together, or pressure may be continuously kept up by a plate held in position over the pad by attachments to the surrounding sound teeth until all trace of danger passes away.

Wounds may be treated in a similar way by the strong chloride, soaked in lint, and bandaged firmly over the bleeding surface, which should, if possible, be kept elevated.

Epistaxis should be treated by the puff-ball (lycoperdon giganteum) and the other measures described under Epistaxis (page 254).

The galvano-cautery may be tried in some instances, and transfusion should always be performed when everything else fails, and the patient shows signs of approaching death. It should not be thought of as long as there is a fair prospect of the hemorrhage ceasing, as the wounds produced by the operation become serious additional elements of danger. All authorities agree in forbidding marriage, and this should be strongly insisted upon with women bleeders, or female members of bleeder families, who may not themselves have shown evidence of the diathesis.

Vaccination should be performed with great caution, and the punctures made as superficial as possible. Death has been known to result from the operation.

For the joint affections common in bad cases of the diathesis, absolute rest and the application of cold evaporating lotions, followod by dry heat to the affected joints are indicated. Splints are necessary in very severe cases to insure thorough immobility.

Extravasations of blood, bullæ, or abscesses should never be interfered with surgically. Ligature of arteries going to the bleeding locality is useless.

HÆMOPTYSIS.

The vast majority of the cases of the present affection will be found to arise during the progress of tubercular phthisis. In discussing the question of treatment, it is assumed that the blood is proceeding from small vessels cut across or ulcerated in the necrotic process associated

with the softening of tubercular nodules, or that the hemorrhage is coming from the bronchial capillaries.

Rest is the first essential. The patient should be put to bed in bad attacks. He may be allowed to have his head and shoulders elevated with a bed-rest. All food should be liquid and cold. Milk is ample for the first few days. Alcoholic stimulants should be avoided in all cases, unless where there is great shock and prostration. Some authorities insist upon a very *dry* diet.

Ice sucked in the mouth, or teaspoonfuls of iced water swallowed, afford a pleasant way of assuaging thirst, relieving cough, and checking hemorrhage.

Speaking should be indulged in only when absolutely necessary.

Counter-irritation by a poultice of mustard, made into a paste with cold water, should be placed upon the front of the chest. Hot poultices should be avoided, and warm applications tend to encourage the hemorrhage. If the quantity brought up is alarming, a large bladder of ice should be laid upon the front of the chest, or wetted towels, between the folds of which pieces of ice or a mixture of crushed ice and salt is placed, may be laid on the thoracic wall.

The good to be got from applications of ice to the chest occurs at once, or soon after the chilling of the skin. If the cold be continued for any length of time, more harm than good is certain to result, as has been demonstrated in Rossbach's experiments. Dry cupping has been found useful sometimes.

The room should be kept cool and well ventilated, if possible without the patient being directly exposed to draughts. A large vessel filled with warm water should be placed under or about the bed, and into this turpentine should be poured in small quantities at frequent intervals, the object being to keep the air of the room saturated with turpentine vapor. The drug may be poured upon cloths suspended in the air, or it may be sprinkled upon sawdust or pine shavings in a safe corner of the room, away from the danger of ignition. This is the routine practice of the writer, and in mild cases little else need be done. The turpentine vapor seldom proves disagreeable, and it is an excellent antiseptic and hæmostatic, and in some cases exercises considerable soothing influence over the cough, which so often complicates the treatment of the affection.

Of internal remedies opium is valuable, unless where there is very profuse expectoration, associated with great weakness. It is in the early stages of phthisis, where hemorrhage may be abundant, that its use is best marked. Its contra-indications are the same in hæmoptysis as in bronchitis, and in the latter stages of phthisis its effects should be carefully watched. A full hypodermic dose of morphine often acts well when not contra-indicated.

The effects of the usual hæmostatic remedies as mentioned (under Hæmaturia, Hæmatocele, etc.) are very uncertain and unsatisfactory.

Ergotine should be our first hope in severe hemorrhage from the

lungs, and no time should be lost in injecting deeply into the tissues one full dose, say 15 minims of the (1:3) hypodermic solution. Its effects may be kept up by small doses given by the mouth. It does not interfere with the action of other remedies of the same class, and, after the full hypodermic dose has been administered, the patient may, in desperate cases, begin with half-hourly doses of some other remedy.

Alum may be given in doses of 5 grains every fifteen or thirty minutes; it may be well dissolved in water, and 10 minims of dilute sulphuric acid can be given with each dose.

It is idle to prescribe a remedy, to be given every four or six hours, to a patient pumping up blood every few minutes. He expects to be dead before the second dose falls due. The moral effect of having his remedy in such serious cases at hand, and to be used every fifteen or thirty minutes, helps to give him confidence, and tends to allay dread and excitement, which are highly injurious to him. It is wise, therefore, to order one full dose of the remedy in a tablespoonful of mixture for example, and direct a teaspoonful of the same mixture to be given every quarter of an hour afterward, until the hemorrhage diminishes; 30 grains of tannic or gallic acid, dissolved in 1 ounce of water, may be given when the hæmoptysis begins, and one-eighth of this amount, in a teaspoonful of water, may be given every twenty minutes afterward.

Acetate of lead may be given (with a little vinegar and morphine) in doses of 1 grain every hour, for eight or ten hours, and often appears to act fairly well.

Turpentine in capsules, 20 minims, may be given at first, and 5 minims every half-hour afterward for six doses. It may also be given in syrup and water, with a little ether.

Digitalis is much recommended, but the writer believes that, in severe and urgent cases, it is much worse than useless. It takes many hours before a safe dose exerts its full action upon the heart and vessels, and to trust to it in emergencies, where every minute is of value, may be a fatal mistake. It is a remedy of great value in hæmoptysis of small amount extending over many days.

Where there is febrile action in strong subjects, aconite or veratrium viride may be given in small repeated doses. Tartar emetic and ipecacuanha have been given with somewhat similar intention to act as depressants.

Nitrite of amyl has sometimes been found to act with great rapidity; by dilating the vessels it may give great relief to the smaller arteries and veins, and, if at hand in severe cases, it should get a trial.

Chloride of barium acts like digitalis, and has been recommended; it is of doubtful value.

Chloride of sodium is always at hand, and it sometimes shows some influence over hæmoptysis; 2 teaspoonfuls may be dissolved in a tumblerful of cold water, and 1 tablespoonful of this solution may be given

every five minutes. The chloride of ammonium is equally efficacious in similar doses.

Cayenne pepper has been recommended in 5 to 10 grain doses by Chéron, who believes that it acts like ergot. The writer has no experience of its action, and there is not much information available as yet.

Hamamelis Virginica, or its distilled extract, hazeline, has been reported by very many to be a specific in hæmoptysis and internal hemorrhages. There is still room for doubt about this action of the drug. Hazeline may be given in doses of ½ to 1 drachm, or more; it can do no harm in any case.

Astringent iron preparations are valuable, and may be given without fear if well diluted; 30 minims of the tincture of the chloride, or 3 grains of the sulphate or the acetate, given as Basham's mixture, are excellent hæmostatics.

Belladonna or atropine, the latter hypodermically, are solely relied upon by some physicians.

Pyrogallic acid, though a dangerous poison, has been successfully used in hæmoptysis and internal hemorrhages; ¾ grain every hour for eight or ten doses is a fair dosage.

Antipyrine has lately been reported as very successful in several cases.

Oxide of silver (1 grain every two hours), sulphate of copper (½ grain every hour, or 5 grains as an emetic), bromide, nitrate, and chlorate of potassium; the entire army of vegetable astringents, including matico and larch; arnica, bryonia, hydrastis, copaiba, and cannabis indica, have all been recommended and tried with varying successes scarcely warranting further trials.

Shoemaker speaks highly of geranium maculatum.

Revulsive measures must not be omitted from the list of remedial agents. A smart saline often acts in a surprising manner. The writer has witnessed, many years ago, in the practice of an old physician, startling results from bloodletting. In one case of pretty advanced phthisis, hæmoptysis had been continuing for many hours and the patient was showing signs of sinking, when the physician, without any apparent hesitation, took out his lancet and struck a large orifice in the vein at the elbow, from which a gush of blood freely flowed. The hæmoptysis instantly stopped, and the patient made a good temporary recovery. Though this was well nigh a quarter of a century ago, the writer has never had the courage to see it tried again.

Sir A. Clarke has drawn attention to the occurrence of hæmoptysis in elderly arthritic patients, and he recommends in such cases renewed counter-irritation, restricted use of liquid diet, sedative cough agents, alkalies, following calomel and saline purgatives, and iodide of potassium.

HEMORRHAGE.

The treatment will depend upon the nature of the disease or injury which has led to the opening of the vessels from which the blood is poured. In internal hemorrhage the lines of practice will be found enumerated under the various headings of Hæmatocele, Epistaxis, Hæmaturia, Hæmophilia, Hæmoptysis, Hæmatemesis, Anæmia, etc.

In external hemorrhage the *general* treatment will be the same as for internal hemorrhage.

Syncope, collapse, or shock may result where the bleeding has been extensive, and it may be the first duty of the surgeon to attend to this symptom. In this stage, bleeding has practically stopped, and nature is perhaps at the moment forming coagula to seal up the open vessel. If the surgeon could be sure that the collapse would certainly pass off by waiting, he should not use active measures to restore the circulation. The collapse or syncope may, however, be fatal if vigorous measures be not immediately undertaken to excite reaction. The skill, coolness, and sound judgment of the surgeon will be required to decide how far he may be justified in an attempt to allow nature to stop the open vessel or to establish reaction at once and tie the bleeding point himself. If the bleeding point is beyond reach and the hemorrhage difficult to control, to hasten reaction by pouring down the patient's throat large quantities of alcohol may in some cases be the worst possible thing to do. Stimulants must be freely given in desperate emergencies and when life is placed in great jeopardy by the collapse. The hypodermic injection of ether or sal volatile, or the rectal administration of brandy, may be required in some cases. The horizontal position must be rigidly enforced, and all operative procedures must be carried out in this position after extensive bleedings. The head should be kept low, and a free current of cold fresh air may be permitted to blow over the face. Strong ammonia or acetic acid to the nostrils, or a dash of cold water to the face, often restores consciousness in such cases. By elevating the lower extremities the blood may be caused to flow toward the empty heart, which may be thus stimulated to renew its pulsations, then pressure may be made upon the abdominal aorta or upon the femoral arteries, or a ligature or tourniquet may be applied to the limbs, with the view of confining the blood to the brain and heart. As a last resort in desperate hemorrhages, an elastic bandage may be rapidly applied to one or both lower limbs, and an Esmarch's rubber cord tied round the thigh, near the groin.

Transfusion may be performed. (See under Anæmia, page 37.) Such procedures will seldom be required in private practice, but two years' experience as resident surgeon in a large hospital brings to mind many cases where patients were brought in a collapsed state, and where the promptest action was necessary to save life. A minute's delay sometimes may be fatal. The most profound collapse and syncope has been witnessed by the writer in hemorrhages following innocent-looking punctures of the venous plexes about the orifice of

the vagina, caused by fractured chamber pots, etc. Such cases are not brought to hospital until almost too late.

If pressure can be made upon the bleeding spot, there is no danger to be feared from active attempts to establish reaction. Once the bleeding point is secured, such attempts should be made without delay.

In securing a bleeding vessel, certain cardinal principles should not be forgotten. If an artery be wounded, the wound in the skin and soft parts, if necessary, should be freely enlarged, and a ligature applied above and below the bleeding point in the vessel. Should the vessel be cut across, both its proximal and distal ends must be separately ligatured.

Where the vessel is a small one, or the stream of blood limited in extent, firm pressure by a graduated compress and a skilfully applied bandage may be sufficient. In some cases this will be the best temporary treatment until reaction has been fully established, when a deliberate dissection subsequently, after the application of an Esmarch's bandage will enable the surgeon to secure the wounded vessel, which could not be found at the time of the active hemorrhage. It may be even necessary in some cases to give up the attempt to find the injured artery, and to ligature the trunk higher up. The writer has successfully done this in cases of cut-throat, where to waste time hunting for the divided branches would have led to fatal results. Acupressure, with a figure-of-8 ligature, may be the most rapid and complete measure in some cases. Torsion may be applied to the divided vessel, but it will be generally found that in these cases the ligature is more satisfactory.

Veins may be dealt with in the same way as arteries, but often the elevation of the limb and moderate pressure will answer all purposes, as in the profuse hemorrhages sometimes following varicose ulcers of the leg.

Styptics are not to be relied upon, though the writer has been able to control formidable hemorrhages, with almost magical rapidity, by thrusting a mass of the puff-ball (licoperdon giganteum), (see fifth edition of *Materia Medica and Therapeutics*, page 581) into the centre of a deep, spouting wound. The pengawar djambi, or paku-kidang, appears to act in a similar way (see same volume, page 596).

Chloride, sulphate, or nitrate of iron, matico (in powder), ice, alum, tannic acid, Richardson's or Ruspini's styptic colloid, cauterization by actual, galvano- or thermo cautery, turpentine, hot water (at a temperature of 120° or 125° F.), and many other astringents have been recommended. In urgent cases, where bleeding is profuse, their trial will be a waste of precious time, though in trivial bleeding they will often meet all requirements. Their use prevents union by first intention.

For capillary bleeding following extensive superficial wounds, operations or flap amputations, the free exposure of the oozing surface to a stream of cold air or iced water, followed by moderate pressure, is generally all that is required. Such treatment is, however, generally

useless until all clots have been removed and every trace of blood sponged from the weeping wound.

The treatment of the wound after the successful closure of the bleeding vessels is to be conducted upon general surgical principles, and the constitutional treatment is to be based upon the lines laid down for the management of anæmia (page 38), modified by the complications present in each case.

When active external hemorrhage is going on, it is scarcely necessary to say that internal hæmostatic remedies, such as may be valuable in hæmoptysis, etc., are of very little use. The treatment of wounds and injuries in subjects of the hemorrhagic diathesis will be guided by the principles enumerated under hæmophilia.

HEMORRHAGE FROM THE BOWELS—See Melæna.

HEMORRHAGE, Post-partum

The treatment should be, in the first instance, *preventive.* Post-partum hemorrhage is a rare event when the cautious physician is present, and directs or carries out the necessary manipulations of the uterus during and after the completion of labor.

After the complete expulsion of the child, the uterus should be grasped from above by the left hand of the accoucheur, and pressure steadily maintained after the removal or expulsion of the placenta. This pressure may, in the majority of instances, be very slight, just enough to enable the operator to feel confident that he can speedily apply considerable force at a second's notice should the uterus show signs of relaxing under his grasp. The thumb should be placed in front, and the fingers dipped down deeply into the relaxed abdomen, so as to seize and squeeze the uterus as firmly as if the operator had the organ in his hand outside the body.

Most authorities now strongly urge that the placenta should not be expressed for at least half an hour after delivery, and many recommend that double this period should elapse before resorting to removal, Ahlfeld insisting that two or three hours should intervene between the birth of the child and the operation of expression.

The habit of applying the pad and binder immediately after the removal of the placenta should be condemned. It has been the cause of many deaths from hemorrhage. With the binder *in situ*, as a rule, little can be known about the state of the uterine contractions. Under a well-adjusted bandage, it is quite possible for the uterus to relax and fill with blood, without giving any warning to the over-confident attendant.

The young accoucheur will never regret the routine practice of keeping up a close watch upon the state of the uterine contractions for a considerable period after the expulsion of the placenta, before having the binder applied. It will be a good practice: 1. Never to apply the binder until after the child has been bathed and dressed; 2. To give

one full dose (30 to 40 grains) of ergot immediately after or before the expression of the placenta; 3. To count the pulse from time to time—a pulse of 100 often indicating or forecasting a smart hemorrhage, though the uterus may be felt quite hard under the fingers; 4. The accoucheur should not give up pressure or kneading until the uterine contraction has become permanent; 5. It is a good practice to put the child to the breast as soon after delivery as possible, in order to excite reflex uterine contractions.

Where hemorrhage has already occurred it should be stopped by immediately grasping the uterus as just described, and by alternately kneeding and squeezing the relaxed organ all clots are expelled, and further hemorrhage for the moment prevented. If the placenta has not been previously expelled the kneading and strong compression exercised by the fingers will probably cause its ejection. Should it still remain in the uterine cavity and the hemorrhage continue, its removal becomes imperative. This is done by the introduction of the hand into the vagina and uterus and the peeling off of the placenta from the uterine surface.

It is well to remember that partial attachment of the placenta to the lower uterine segment is a common cause of hemorrhage, the upper portion in the superior segment of the uterus being firmly attached while the blood flows from the partially attached lower part of the placenta. In these cases operative interference may be demanded without delay.

Should the hemorrhage continue after the extraction of the placenta and all the clots found in the uterus and vagina, notwithstanding the steady, firm kneading from above, the physician may again introduce his right hand into the relaxed uterine cavity, and pressing his clenched fist against his left hand applied above, he may freely squeeze, knead, or grind the uterine walls between, until firm contraction is established. In one apparently hopeless case the writer introduced a large sponge soaked in strong vinegar and withdrew his hand, keeping up strong pressure from above and squeezing both uterus and sponge until permanent contraction was aroused.

A less formidable procedure is to introduce the hand into the vagina and press the uterus firmly between it and the hand applied as before outside and above. By directing the tips of the fingers into the anterior or posterior vaginal *cul-de-sac*, the anterior and posterior uterine walls may alternately receive the chief portion of the pressure.

Ice may be applied in either hand, or a large rounded lump may be inserted into the uterine cavity. Cold or iced water injections or irrigations may be employed, and iced compresses may be applied to the genitals or abdomen. While keeping up compression for any length of time, it is a good plan for the accoucheur to have a large jug of iced water into which he can immerse one hand while resting it after the muscular exertions entailed by the kneading process. The cold hand can then grasp the uterus, while the other is in turn dipped into he ice water. In this way, if no assistance is forthcoming, compression

may be kept up for a considerable period. The relaxed organ should not be intrusted into the hands of an ordinary nurse unless the physician can place the utmost reliance upon her skill and steadiness.

Hot water injections or irrigations of the interior of the uterus act as powerful local hæmostatics and cause generally speedy and firm contraction. The temperature should be about 115° F. to 120° F.

Vinegar or diluted acetic acid, as mentioned, may be injected or introduced upon a sponge into the uterine cavity.

Alum, tannin, alcohol, acetate of lead, hamamelis, tincture of iodine, and many other substances have been recommended for local application; but if the bleeding has resisted the previously mentioned measures, the employment of these is only waste of precious time.

As a last resort, the physician will proceed to inject into the uterine cavity a strong solution of chloride of iron. One part of the solid crystalline ferric chloride in 10 parts of water is the usually accepted strength. The B. P. diluted solution or the U. S. P. tincture may be employed. Weaker solutions (half the above strength or less) may be used, and Spiegelberg strongly warns the practitioner against employing the concentrated solutions which he affirms are exceedingly dangerous. He uses a solution composed of a tablespoonful of the strong solution in 17 of water. The writer has injected the strong solution (1 of the solid in 10) without ever witnessing bad results, but his experience is too limited to speak decidedly upon this point, though he would remark that as the injection of iron should never be undertaken except as a *dernier ressort* in cases of threatening collapse, it would be well not to waste the time spent upon trying a very weak solution, but in desperate cases inject the 1 : 10 solution.

Weak injections might be profitably employed in the treatment of cases where persistent oozing results from a doughy, imperfect contraction of the uterus. Some authorities condemn the injection of the iron solution, but recommend that the interior of the uterus should be swabbed out with it by means of cotton-wool soaked in the solution.

The writer will certainly try the licoperdon giganteum in the next serious case of post-partum hemorrhage if he chances to have it at hand.

Dührssen plugs the entire cavity with a large strip of iodoform gauze, which he pushes up to the fundus, and fills the entire cavity and part of the vagina in a fan-like fashion.

Recent experience looks as if this iodoform gauze tampon is to be the most successful and least dangerous of all methods yet known for the treatment of post-partum hemorrhage.

It acts in two ways: it excites the uterus to firm contraction, and it stops the bleeding by its direct pressure on the open vessels. The reports from numerous observers all over the world appear to establish the superiority of this method over the injection of iron plan.

Koch has tried and suggested a new method which we hope will be seldom tried in this country. He *inverts* the uterus and puts a rubber

band round the neck of the inverted part, which he removes in six hours, after which the uterus is returned and ergot given.

As regards internal or constitutional remedies, the whole list must be rejected save two tried members. Lead, tannin, digitalis, hydrastis, capsicum, hamamelis, chloride of soda, alum, etc., are useless in the very cases where most needed.

Ergot is the most valuable known drug in treating post-partum hemorrhages. It should be administered immediately after the bleeding has started, even if it had been previously administered during the labor or afterwards as a preventive of hemorrhage. Full doses must be given, and there is no preparation equal in promptness to the freshly prepared infusion, save the hypodermic injection of ergotine (1 : 3). This latter should be always employed in urgent cases; 10 to 15 minims may be deeply injected into a muscle, or even into the uterine walls, in desperate cases, and may be repeated in from fifteen to twenty minutes; 1 drachm of ergot, made into an infusion, may be administered by the rectum; 4 or 6 drachms may be given in a severe case. This remedy should be always employed in conjunction with the local manipulations already described.

Quinine is a valuable remedy, but must be given in very large doses in such cases; 15 to 20 grains in wafer paper may be administered. It is apt to cause vomiting, and its action is slow.

Pressure upon the abdominal aorta, bandaging the lower extremities, and the various measures mentioned upon page 313, may be tried in desperate cases. Collapse must be met by stimulants, frictions, etc., as described upon page 133.

After the firm and permanent contraction of the uterus is established, a well adjusted pad should be placed above the fundus of the uterus, and a tight abdominal bandage should be applied, and the patient closely watched until reaction has completely set in. Transfusion and other remedies for the acute anæmia following extensive bleedings, are enumerated in the previous article and under the heading anæmia, but the hypodermic or intravenous injections of weak saline solutions (chloride of sodium, 1 drachm; water, 1 pint) give the best results and meet every requirement of the case.

HEMORRHAGE FROM THE STOMACH—See under Hæmatemesis.

HÆMORRHOIDS.

There are but few affections in which there is greater scope for the intelligent and successful use of remedial, palliative, and preventive measures. The physician is generatly consulted during what is called by the patient, "an attack of piles," and it will commonly be found, as pointed out by Curling, that in these cases a varicose condition of the veins of the lower part of the rectum or anus has existed for years without causing any inconvenience. The "attack" has followed some

indiscretion in diet, excess in drinking, constipation, or other violation of some fundamental law of health. It may, therefore, be advisable to consider at this place

Preventive treatment.—Sedentary habits should be given up for active, open-air exercise when possible, too much standing being as prejudicial as too much sitting. Clothing should be warm but not excessive, and special care should be exercised over the covering of the feet and lower extremities. Damp and cold to the feet being especially injurious.

Constipation must be prevented by the various means enumerated under this heading upon page 140, and the evil influences of pressing or straining while sitting upon the ordinary ill-devised, modern water-closet seat, as previously mentioned, must be guarded against. Constant use of purgatives is a serious evil. One point should always be insisted upon by the attendant, it is of vital importance, *i. e.*, that the prolapsed piles, or varicosed mucous membrane, should be gently pushed up after every evacuation. A great deal of the ordinary hæmorrhoidal trouble is produced by the constriction of the external sphincter upon the prolapsed tumor, causing irritation, inflammation, thrombosis, and other mischief. This may be prevented or warded off for a long or indefinite time by attention to the above rule.

Diet should be varied and regular, excess being avoided, and, as a rule, alcohol in every form is injurious except in very small quantities. As a rule, the diet best suited to the hemorrhoidal patient is the diet which keeps his bowels in the most desirable condition. A tablespoonful of pure olive oil in the morning, or at the conclusion of dinner, sometimes keeps the motions agreeably soft. Orange marmalade or stewed fruits are valuable, but figs in every form should be prohibited, as their minute, spherical seeds often lurk in the recesses between the lubules of the hæmorrhoidal tumors, and seriously aggravate the tenesmus and discomfort.

Absolute cleanliness and the use of the softest paper or sponge are daily essentials.

Bladder, urethral, renal, pelvic, hepatic, intestinal, cardiac, pulmonary, and other causes of increased blood pressure in the inferior hæmorrhoidal veins must be attended to.

As a preventive and curative measure there is nothing more valuable than small injections of cold water. 5 to 10 ounces thrown up act as a tonic to the relaxed membrane and bloodvessels, relieves tenesmus and constipation, stays hemorrhage, and promptly puts an end to pruritis.

The confection of pepper (Ward's paste), copaiba, confection of senna, sulphur, castor oil, tar, glycerin, turpentine, hamamelis, ergot, cubebs, pulv. glycyrrhizæ comp., infusion of beet root, rhus tox., and many other substances and combinations are believed to exert a beneficial action upon the diseased membrane when administered by the

mouth, but except for their laxative effects their action is doubtful or at the best uncertain, and reliance must be placed upon local remedies.

The local treatment of hæmorrhoids will vary with their exact situation, and with the stage of the affection in which they may chance to fall under the care of the attendant.

Inflamed piles, whether external or internal, are generally very painful, and often are accompanied by intense suffering when strangulation or constriction has been caused by the grasp of the sphincter. This agonizing pain is often best marked in cases where the pile is small and of comparatively recent formation. Sedatives, and not the knife, are indicated in such cases. Leeches to the margin of the anus, or near to the surface of the tumor, ice externally, or slipped inside the sphincter, or injections of iced water, may relieve pain and subdue congestion and throbbing. Fomentatians or hot poultices, smeared with belladonna or opium extracts, are often more soothing than cold, and what affords relief at one stage may be aggravating twelve or twenty-four hours afterward, and the physician must ring the changes between cold and heat, dryness and moisture. It will be necessary in such cases to effectually relieve the colon at once, and this is best done by copious warm water enemata, which may be repeated from day to day. Rest in bed in the horizontal position is an essential element in the treatment. Local anodynes are most unsatisfactory in their effects upon congested, inflamed, or painful piles. Remedies of this class very often aggravate the distress. Cocaine, pastes, ointments or lotions of belladonna, opium, morphine, chloral, chloroform, aconite, tobacco, hamamelis, hyoscyamus, carbolic acid, creosote, and iodoform, are often useless as pain relievers.

Morphine in the form of suppository (½ grain) will after some time give ease, but not until it affects the cerebrum; in fact, it does not act as a local sedative in these cases. The pain is caused by the increased tension, and is not caused by the irritation or hyperæsthesia of excoriated nerve endings as in fissure or ulcer of anus. Hence, local depletion, hot fomentations, warm injections or poultices, or iced injections or compresses are to be relied upon.

As a local rectal anodyne, when the tension has subsided, there is no remedy hitherto used equal to conium. The preparation introduced by the writer (see page 47) is the only good method of using the drug in the form of an ointment. It may be pushed up the anus or freely smeared over the tumor, or applied upon the poultices. Its use is not followed by the speedy relief which it causes in fissure or pruritus, nevertheless it will give better results than the ordinary remedies used to relieve the pain of inflamed piles.

The ointment of galls, 10 parts, with opium, 1 part, is a favorite remedy in chronic cases, a little cocaine, or belladonna extract, may be combined with it, but where a local anodyne and astringent effect is needed, here again the combination of the conium ointment with sulphate of iron (10 to 20 grains to 1 ounce) is in every respect better.

Inflamed piles should never be cauterized, excised, or ligatured. If a thrombus form, a longitudinal incision should be made with the lancet and the clot turned out. If suppuration occurs a free incision with an abscess knife will give speedy relief.

Sloughing piles are best treated by poultices. The inflammatory, or sloughing process, may end in the removal of the trouble, and may effect a permanent cure.

In piles of long standing associated with periodical prolapse, slight hemorrhages, or mucous discharge, the habitual use of cold water injections (5 to 10 ounces), absolute cleanliness, and frequent spongings with cold water, with the application of the conium and iron ointment after each motion, often suffice to effect a cure.

In more obstinate cases, astringent injections, as tannic acid (20 grains, water 3 ounces), sulphate of iron (10 grains, water 3 ounces), tincture of iron (1 drachm, water 3 ounces), hamamelis (4 drachms, water 3 ounces), alum (40 grains, water 3 ounces), hydrastis (tincture 4 drachms, water 3 ounces, may be thrown up and retained as long as possible. Sometimes excellent results may be obtained by injecting ½ ounce of hazeline undiluted.

Suppositories of the same substances may be used with advantage.

Ointments are also useful, the best being sulphate of iron (30 grains to 1 ounce of lard). Dilute citrine ointment (1 : 3) is also a good application in chronic cases accompanied with mucous discharge; it may also be used as a suppository. Lead acetate may be employed in the same way. These applications generally cause much pain and smarting.

Nitric acid, or the strong solution of nitrate of mercury applied to internal prolapsing hæmorrhoids, often gives satisfactory results. The speculum being introduced, and the surface of the pipe wiped dry, the strongest acid is freely applied by a piece of wood or a glass brush, the skin being very carefully guarded, and the cauterized surface smeared over with chalk and oil afterward. As a rule, there is not much pain if the patient keeps to bed for some hours, and excellent results often follow.

Cauterizing the surface of the pile with a hot iron in a linear manner acts in the same way. Both remedies leave an eschar, which sometimes is rapidly followed by shrivelling and disappearance of the enlarged vessels, and both are valuable methods of radical cure where the ordinary operations are contra-indicated, especially in cases where the tumor is small and sessile.

The injection of strong carbolic acid into external or internal hæmorrhoids is not free from serious danger, and should not be performed. Edwards reports brilliant successes in thirty-eight cases by injecting 2 to 5 minims of carbolic acid solution (1 : 10 of glycerin and water), with an ordinary hypodermic needle, into the centre of each pile, and returning it immediately within the sphincter. The results are most satisfactory, no trouble ever resulting, and the patient is rapidly cured,

without lying up a single day. Further reports will be awaited with interest, especially as other operators, who have given this method a trial, speak in a very different strain about it, reporting pain, inflammation, and failure as regards radical cure, and unless some new facts are broughs to light, the method will hardly stand the test of time.

Unna's plan of treating piles by chrysarobin has been modified by Kosobudski, who uses an ointment of chrysarobin, 8 parts; iodoform, 3 parts; extract of belladonna, 6 parts; and vaseline, 150 parts. For internal piles he uses suppositories, which he claims cure in three or four days. The following is their composition:

℞.—Chrysarobini	gr. j.
Iodoformi	gr. ½.
Ext. belladonnæ	gr. ½.
Ol. theobromæ	gr. xxx.
Glycerini	q. s.—M.

The ordinary surgical methods of removing piles are by scissors, the knife, galvano-cautery, or ligature, or by clamping, cutting, and the actual cautery combined,or by crushing and excision combined. External piles may be removed by the use of scissors curved on the flat. As a rule, the hemorrhage is trivial.

Cocaine (5 per cent. solution), carbolic lotion (1 : 30), or the ether spray will generally produce sufficient blunting of the cutaneous sensibility.

McCarthy points out the danger of removing too much skin if the pile be situated close to the margin of the anus, as troublesome stricture of the orifice may result. This is unlikely. By catching up the folds of skin containing the pile with forceps, the scissors or knife should snip them off in lines radiating toward the anal aperture. The bleeding may be checked by the application of ice, or by the pressure of a pad of lint, held in position by a T-bandage.

Internal piles may be removed by ligature. Chloroform may or may not be used. The operation is not necessarily a very painful one. The bowel should be well emptied by a large dose of castor oil the night before the operation, and a copious warm water injection should be given immediately before operating. If the patient possesses sufficient fortitude to undergo the operation without chloroform, he can readily bring the hæmorrhoidal mass into view by straining after the action of the enema. Should chloroform or ether be administered, this can be readily accomplished by an assistant, who everts the mucous membrane.

The patient lying upon his left side, with the legs well drawn up, an assistant separates the buttocks, and when the piles are well protruded, the surgeon seizes each with a toothed pile forceps, and pulls very gently upon it, while he snips through the mucous membrane at its base with a pair of blunt-pointed scissors, leaving a groove round the insertion of

the tumor close to the intestinal surface. Some surgeons prefer to make this groove with a tenotomy knife. As the forceps are held by an assistant, who pulls gently upon the pile, the surgeon passes a stout waxed silk or hemp ligature around its base, taking care to include the entire mass, and allowing the ligature to sink into the groove as it is tied as tightly as possible.

Each pile, when there are several, is treated in the same way, the ends of the ligature cut off, and the entire mass, with the short ends of the ligatures, should be returned within the sphincter.

Where the pile is large and its base broad, after snipping through the mucous membrane at its base the surgeon should transfix it with a curved needle armed with a double ligature. After cutting its loop, each half should be tied separately. Some surgeons remove a portion of the strangulated pile before finally tightening the ligature.

It is advisable to remove any external piles by scissors at the same time, taking care not to include them or any "intermediate" ones in the ligature while tying the internal ones.

After the operation the patient should remain in bed and have a $\frac{1}{2}$ grain morphine suppository, or a suppository of conium. Ice may be applied locally, though it is seldom required, and hot fomentations may be grateful.

The bowels should be permitted to rest for three days at least, castor oil, cascara, or a large olive oil or warm water enema being required to start them after all pain, throbbing, hemorrhage, retention of urine, tenesmus, or other troubles are relieved.

The ligatures should be allowed to come away, without any interference, as the bowels act. They often come away about the fifth or sixth day, but may be delayed until the twelfth.

It is surprising how little pain follows the operation in many cases, and though occasionally the reverse is true, the writer has had difficulty in keeping the patient in bed for a sufficiently safe time. As a rule, ten or fourteen days should be insisted upon. Where there is much fetor, (a rare event), the rectum may be washed out daily with antiseptic lotions, or a suppository containing 5 grains of iodoform may be used. Hemorrhage may be met by ice, and injection of chloride of iron in weak solution, or the bleeding point may be touched with the strong solution or with the cautery after everting the mucous membrane and gently drawing down the piles by cautious traction made upon the ends of some of the ligatures.

The operation by clamp and cautery is, upon the whole, preferable to the ligature. After a thorough evacuation of the bowel by a purgative or a large tepid water enema, or by both agents, the patient is placed upon his back and brought completely under the influence of chloroform or ether. The lithotomy position with the crutch is the best where assistants are not numerous, but some surgeons prefer the patient to lie upon his left side with the thighs well flexed and the nates separated by an assistant. By introducing both thumbs into the

anus and making steady traction the sphincter is readily dilated; the pile, seized with forceps, should be gently pulled down, and the clamp applied to its base. With a scalpel or bistoury the pile is excised and the actual, galvanic, or Paquelin's cautery applied to the stump, so as to burn it down almost to the level of the clamp, which is then removed, any bleeding point being again touched by the cautery, and the patient treated afterward as in the case of using the ligature.

Allingham and others operate by using a powerful screw-clamp, which is applied to the base of the pile, and after applying strong pressure in a longitudinal direction for a couple of minutes, the projecting portion of the tumor beyond the crusher is excised and the instrument removed. No hemorrhage whatever need occur, and speedy and comparatively painless recovery ensues.

Whitehead's operation of excision of the entire pile area is not one to be recommended when the ligature and clamp and cautery continue to give such satisfactory results. Mathews reported in 1888 that he had used the ligature in 1000 cases without a single recurrence of the disease and without a death.

HÆMOTHORAX.

When this is caused by some blood condition, as in purpura, cancer, tubercle, etc., the treatment of the primary cause is of first importance. In such cases probably only a blood-stained serous fluid exists, and the management of the case will be best carried out upon the lines indicated for pleural effusion.

Where active bleeding is occurring into the cavity of the pleura without any external wound, the case may be considered, in the majority of instances, as beyond the reach of art. Nevertheless, there are certain measures which may afford some hope. The patient should be placed in bed, and have ice freely applied to the affected side; he should lie upon this side unless where this interferes with the repeated applications of the ice. Food should only be given in quantities just capable of maintaining life, and the utmost quiet and freedom from excitement must be maintained.

Opium should be given in moderate doses, and of all the internal hæmostatics there is only one worth trying in such cases, and this remedy is ergot, which may be given hypodermically in doses of 2 grains of ergotine. Rapid purgation by a *concentrated* solution of magnesia sulphate, as recommended by Professor Hay in dropsy, may be tried. (See author's work on *Materia Medica and Therapeutics*, fifth edition, page 452.) The old heroic method of bleeding freely from the arm may, by rapidly making an impression upon the circulation, check internal hemorrhage. (See under Hæmoptysis, page 312.)

Where the blood has been already poured out in quantity sufficient to compress the lung and cause serious embarrassment to the breathing, a trocar and canula may be employed to draw off the fluid blood or

the serum of coagulated blood. If a wound exist it may be enlarged, and a fair sized drainage-tube may be inserted into the pleural cavity.

Should the hemorrhage be coming from a wounded intercostal or internal mammary artery, this must, if possible, be stopped by ligaturing both ends of the divided vessel after enlarging the wound. In order to accomplish this it may be necessary to remove a portion of the rib or its costal cartilage.

Plugging of the wound may be performed in such a way as to ensure that the hemorrhage be not simply made to flow on internally after the aperture is closed externally.

HARE-LIP.

The first question to be decided in the treatment of this unsightly deformity is, "*when* to operate?" The answer will depend upon many considerations. Chief of these will be the ability of the infant to take nourishment. Should the cleft in the lip prevent the successful use of the mother's nipple the operation may be performed within the first week or ten days with advantage.

As a rule, in this country the operation is deferred too long, the infant suffering in health from the difficulties of obtaining nourishment, so that when presented for operation it is not in a favorable condition. The first duty of the physician in all cases is to see to the nutrition, and if sucking is impossible or difficult, the infant should be fed from a spoon with the milk drawn from its mother's breasts until sufficiently strong to stand the shock of a cutting operation and its consequent hemorrhage. When there is no difficulty in sucking, the third month is a favorable time for remedying the deformity. Where there is projection of the inter-maxillary bone, and cleft palate, the end of the sixth or eighth month will be early enough to think of operating.

A towel being wound around the infant so as to fix its arms close to the body, chloroform is administered as the little patient lies upon his back on a table or upon the lap of a steady nurse, with his head resting upon the knees of the surgeon. The lip must be thoroughly separated from its bony attachments by cutting and gently tearing through the reflected mucous membrane in the neighborhood of the cleft and beyond it, before any attempt is made at paring the edges of the cleft. After the soft parts are found to glide freely over the alveoli a fine, sharp, scalpel is used to pare off and completely detach the edge of one side of the cleft until the red margin of the lip is reached, when the incision is prolonged clean through the blunt angle and for a short distance along the free margin of the lip by turning the cutting edge of the blade outward. The remaining edge of the cleft is similarly pared until the lower angle of the cleft is reached, when the knife is again turned outward to continue the incision along the red margin of the lip without detaching the dissected paring, which is then stitched to the opposite blunt angle so as to fill in the notch which would otherwise be left in the free margin of the lip.

One or two fine hair-lip pins are inserted, about one-third of an inch from the margins of the wound, through all the tissues down to the mucous membrane, the lower pin being adjusted first. By means of a twisted suture the margins of the cleft are brought together, fine horse-hair or silver sutures being inserted at intervals between the pins and along the lower margin of the cleft, so that complete and accurate adjustment of the edges of the wound is obtained in all its extent without any pouting or puckering being visible on the superficial or mucous aspects of the lip. To secure this latter desideratum, a few fine sutures should be put in upon the deep or mucous surface of the lip. With cutting pliers the pins are cut short, and a few pieces of waterproof adhesive strapping laid on across the lip and cheeks from ear to ear, so as to remove all tension upon the lips of the wound. A Hainsby's truss answers the same purpose. The pins may be removed inside of forty-eight hours, and the sutures gradually cut through one by one from the third or fourth day as union progresses. Much of the success of the operation depends upon the careful nursing of the first few days, and an experienced nurse is of the greatest value. The child should be spoon-fed for five or six days until union is complete.

Bird's method of operating by the rectangular flap ensures the minimum of deformity, especially in those cases where there is a marked want of symmetrical form between the sides of the cleft.

In double hare-lip the margins of the clefts are to be treated in the same way, and, if there be no bone displacement, the operation on both sides being carried out at the one sitting the case presents no difficulty.

Where the inter-maxillary bones project, they must, if possible, be preserved by twisting them into their proper place or by severing partially their posterior attachments and forcing them back with strong forceps into the gap in the anterior part of the hard palate. Their destruction means the loss of the central and perhaps of the lateral incisors. After repeated failures in obtaining union, paring of the edges of the cleft may again and again be tried with some prospects of success at a later age.

HAY FEVER.

Volumes have been written on the pathology and treatment of this very troublesome affection, and the greatest differences of opinion still exist upon the best means of dealing with it. Several distinct disorders have been described as "hay fever" by different writers, and this has led to much confusion and disappointment in treating them.

The great majority of cases, as clearly pointed out by Bronner, may be divided into two well-marked classes, *i. e.*, those in which the mucous lining of the nasal passages, perfectly normal at all other times, swells, becomes congested, secretes freely, and is associated with sneezing and coryza.

The second group of cases includes those where the signs of chronic

hypertrophic rhinitis are always present, as evidenced by a thickening of the mucous membrane covering the lower and sometimes the upper turbinated bones, the septum, and nasal floor.

This latter group is the more common, and, when the hay season comes on, furnishes a large number of the cases of so-called hay asthma or hay fever. The first class of cases, though amenable, to a certain extent, to purely local treatment, are neurotic in their origin and require constitutional remedies. The second class must be boldly met by local agents, and it is in dealing with them that the most satisfactory and lasting results have been obtained. There is litte use in the application of sedative or caustic solutions for the removal of the chronic rhinitis; by far the best measure is the galvano-cautery and cocaine.

The object is to so cauterize the erectile tissue as to form an adherent cicatrix which will permanently bind down the mucosa to the periosteum, and, at the same time, ensure the complete destruction of the hypersensitive areas existing in the nasal membrane. By a 15 per cent. cocaine solution the thickened mucous lining is rendered insensible, after which, with a fine blade or platinum point, a deep groove is burned with the galvano-cautery along the entire length of the inferior turbinated bone.

There is a very fair prospect that the removal of the hypertrophic rhinitis will prevent, or very materially modify, the paroxysmal sneezing and coryza produced by the inhalation of pollen and dust.

The treatment of those cases of true or neurotic hay fever in which no structural alteration is apparent in the nasal membrane, except at the time of the attack, is much less satisfactory. In such cases remedial measures must be directed, (1) to the neurotic state, (2) to the local hyperæsthetic condition, and (3) to the prevention of the access of the irritant.

The first indication is best carried out by the use of every means, whereby the highest standard of health can be maintained in the intervals between the attacks. Tonics, like arsenic, zinc sulphate or valerianate, iron, bromides, quinine, strychnine, iodides, shower-baths or sea bathing, are certainly worth trial during the months preceding June; while the attack is on they may be worse than useless. The indication for each remedy will be found by studying the peculiarities of each case.

Coupled with such preliminary treatment directions should be given to the patient whereby he may attempt to avoid the irritating cause of the seizures. Any locality where the pollen of grasses and other plants exists in abundance should, as far as possible, be avoided. City in-door life, a sea voyage, or residence in a high altitude, or a sojourn at a seaside spot, destitute of much vegetation, may enable the victim of hay fever to stave off the attacks. Respirators, goggles, veils, and plugs of cotton wool in the nostrils may in some cases mitigate the amount of coryza and sneezing by preventing the admission of the

pollen grains, but, as a rule, their use causes acute discomfort, and, as preventive remedies, they are generally unsuccessful.

Treatment directed to allaying the local irritation is of more importance than constitutional or tonic remedies.

Antipyrine in full doses (15 grains) in some cases possesses the power of cutting short the attack. Should it fail after a few trials it may safely be abandoned.

Morphine, aconite, pilocarpine, lobelia, muscarine, caffeine, salicylic acid, veratrum viride, grindelia, atropine, hazeline, bromides in full doses, quebracho, and many other powerful drugs have been administered with very indifferent successes, and with the exception of the occasional usefulness of antipyrine or antifebrin, remedies given by the mouth, are generally most unsatisfactory, and the physician has to place his reliance upon local treatment.

Of all the innumerable local remedies there is none to equal in rapidity and certainty the free use of the galvano-cautery. After local anæsthesia the sensitive areas on the nasal membrane should be destroyed, and an adherent cicatrix produced over the surface of the inferior turbinated bone, with a view of preventing erection of the mucous membrane, as already described upon page 327. In proportion to the thoroughness with which the operation is carried out will the success be, and sometimes the cauterization must be repeated several times.

Next in value and less formidable, at first sight, is a method of treatment introduced by Sir Andrew Clarke. In the writer's hands it has given much satisfaction, one case yielding completely to its use. The interior of the nose and the pharynx (through the nostrils) are freely swabbed out with the following solution:

℞.—Glycerini acid. carbolici (1 : 4) ℥ij.
Quininæ hydrochlor. ʒij.
Hydrarg. bichlor. gr. j.—M.
S.—To be applied to the inside of the nostrils.

Its application is followed by pain and smarting and considerable aggravation of the local irritation. This, however, speedily subsides.

W. Williams reports highly of a nasal spray, after failure of most of the above, consisting of a 1 in 1000 solution of the iodide of mercury.

Cocaine has been extensively tried as a local anæsthetic in this affection, and notwithstanding the warm praises of Ringer and Murrell, it has not gained in favor. In selected cases where the paroyxsms are severe and short, its application is followed by a relief which justifies its use, but, as a rule, its effects are too transient to make an impression upon the disease.

A 10 per cent. solution almost immediately reduces simple erection of the mucosa and relieves nasal obstruction, but, as pointed out by

Hall, the secondary effect of the drug is to cause dilatation of the vessels which finally leads to increase in the thickness of the membrane and aggravation of the disease.

Tabloids, containing $\frac{1}{4}$ grain, may be gently pushed up into the nostril as far as they can be carried by the tip of the little finger, and, as a rule, speedy temporary relief may be thus easily purchased.

A spray may be employed when time is not an important factor, but the tabloids can be carried about by the patient and used at a moment's notice. Antipyrine solution (15 grains to 1 ounce water) may be used as a spray, and is not open to the serious objections that maintain against the habitual use of cocaine. Its effects are not, however, so prompt or pronounced.

H. C. Wood recommends bougies of cocao butter containing each 1 grain cocaine and $\frac{1}{120}$ grain atropine, thrust in between the septum and the swollen turbinated bones while the patient is lying down.

Menthol rubbed over the sensitive areas is also in some cases efficacious in checking or modifying the attack. Hill uses a 10 to 20 per cent. solution in oil, brushed or sprayed over the sensitive regions.

Nitrate of silver (5 to 15 grains to 1 ounce.) may be used with a brush.

Terebene, creasote, pinol, bromine, iodine, camphor, carbolic acid, or oil of peppermint or eucalyptus, mixed with hot water and used as an inhalation, have been often productive of benefit in allaying irritation, relieving sneezing, and checking coryza.

Chloroform has been resorted to with advantage—the vapor of a few drops inhaled from the handkerchief or the palm of the hand.

Strong acetic acid or ammonia inhaled from a bottle is a harmless and convenient remedy, and is sometimes beneficial; and strong liniment of iodine (1 : 10) may be used with advantage in the same manner.

The usual asthma remedies, as Girdwood's and Himrod's powders (see Asthma, page 58), burning nitre papers or cigarettes, or smoking stramonium, datura tatula, lobelia, or tobacco may be tried.

The nasal douche is of much value in some cases, and by its means corrosive sublimate (1 grain in 5 ounces), boroglyceride (20 grains to 1 ounce), quinine (1 grain to 1 ounce), iodide of potassium (4 grains to 1 ounce), iodine ($\frac{1}{2}$ grain to 5 ounces), aconite (2 minims of the tincture to 1 ounce), hazeline (1 drachm to 2 ounces), sulphurous acid (2 drachms to 5 ounces), carbolic acid (1 drachm to 10 ounces), tannin (3 grains to 1 ounce) may be applied to the nasal membrane and back of the pharynx.

The various snuffs consisting of bismuth, sugar, morphine, gum, etc., are worse than useless.

HEADACHE.

As headache is but a symptom of a large number of widely different affections, its treatment cannot in a work like the present be discussed satisfactorily under this heading. Where headache is a prominent symptom of any disorder its management will be fully referred to under the name of the disorder. (See Meningitis, Megrim, Typhus and Typhoid Fevers, Amenorrhœa, Bright's Disease, etc.)

The only rational treatment of headache must consist in an attempt to remove its cause when this is possible, and the most common cause which the physician meets with in practice is some altered or poisonous condition of the blood manifesting itself by its toxic influence upon the cerebral centres. The general rule in such cases should be to so act upon the eliminatory organs as to cause the excretion of the offending material from the system. The marked success following the purging, sweating, and diaphoretic remedies given to relieve the intense cephalalgia in uræmia is a striking proof of this; so also is the magical effect of active open-air exercise in giving relief to the headache caused by breathing impure air or an atmosphere impregnated with carbonic or other gases. The headaches of fevers and inflammatory conditions, though probably depending upon a similar cause, is not so dealt with, as the abnormal heat production and manufacture of the toxic agent progresses in spite of treatment. Nevertheless, considerable relief may be obtained in such cases by antipyretics and by smart counter-irritation to the back of the neck and occiput.

It is worthy of note how frequently a sinapism applied to this region relieves many different varieties of severe headache depending obviously upon different causes.

Congestive headache is speedily relieved by smart purging, and counter-irritation applied to the lower extremities, and in severe cases leeching, cold affusion, ice, and bromides.

Anæmic headache, upon the other hand, is amenable to iron, quinine, stimulants, and concentrated food, remedies which aggravate the foregoing condition. This class of cases is sometimes greatly relieved by small doses of nitro-glycerin or amyl nitrite.

Headache depending upon occular troubles and astigmatism yields speedily to measures which correct these causes; and as this form of cephalagia is much more common than is generally imagined, the careful examination of the eyes in obscure cases should not be overlooked. The writer has seen some cases of severe and chronic cephalalgia yield almost immediately to skilfully selected spectacles.

The reflex headache, depending upon stomach troubles and acute dyspepsia, subsides rapidly after evacuation of the gastric contents. Hence the great value of emetics in such cases. The mineral acids, bicarbonates of soda and potash, and nux vomica often relieve cases belonging to this group. Oil of eucalyptus, in doses of 5 minims, often relieves various forms of headache.

Uterine and menstrual derangements, as a cause of headache, are well recognized, and, as a rule, the head pain rapidly subsides upon the removal of the cause.

Gout or uric acid diathesis is sometimes associated with severe headache, and, notwithstanding the high praise given to full doses of salicylate of soda, the writer has found it often fail utterly. The white mixture, in full cathartic doses, does better than anodynes.

Under megrim will be fully enumerated the host of remedies used to relieve nervous and sick headaches, and though the mysterious and striking powers of antipyrine and antifebrin are best demonstrated in severe migraine, nevertheless it must be remarked that in many cases not migrainous these remedies relieve pain in a remarkable manner, and as routine agents for the relief of headache they are much more valuable than bromides and caffeine.

Electricity has been tried with varying success in several varieties of headache. The writer has obtained good results from a weak continuous current of four Leclanché cells where other measures failed. Large doses of iodide of potassium have the same peculiar property of relieving deep-seated, obstinate cephalalgia, and in the headache depending upon cerebral tumors, it should always be steadily administered, and the dose may be increased until 30 grains are reached. Alternating with the doses of this drug, full quantities of antipyrine may be given, in conjunction with a series of small blisters upon the scalp, and counter-irritation to the nape of the neck.

The headache caused by inflammation of the frontal sinus is treated by Seiss with pledgets of cotton wool soaked in a 5 per cent. solution of cocaine, after which any mild antiseptic spray is used, and when all discharge is washed away, he insufflates the nostrils with a powder consisting of 6 grains of morphine, 1 grain of atropine, 2½ drachms of bismuth, and 1½ drachms of acacia.

HEAD INJURIES.

The uncertainty of diagnosis renders the treatment of these affections more than ordinarily difficult and embarrassing. Only a faint and imperfect outline of their management falls under the scope of the present volume. Considering that the most serious consequences may ultimately follow injuries which leave no visible external mark behind them, the surgeon will be wise who treats all head injuries as serious when first coming under his notice.

The key to the diagnosis and treatment of these accidents is to be found in a careful examination of the mechanical forces at work in the production of the injury. Only in this way can a fair estimate be made of the amount of damage sustained by the cerebral tissue and bloodvessels, simple wounds of the scalp and fractures of the cranial bones possessing little importance, unless when associated with internal laceration or contusion.

Concussion symptoms, if present, are to be treated by absolute rest

until reaction sets in (see Concussion, page 134, and Collapse, page 133), warmth to the surface by hot-water bottles and warm flannels, and, in cases of severe concussion and collapse, rectal injections of warm milk. Counter-irritation to the extremities in a mild form may be tried, but alcoholic or other stimulants must be avoided, or only given in most exceptional instances.

The great difficulty in dealing with these cases is to avoid falling into the error of doing too much. Where reaction is slow of appearing, there is probably some serious damage to the brain, and if the attendant cannot restrain himself and assume a position of masterly inactivity, his interference, prompted by a feeling that he must do something, will probably result in hastening a violent reaction, which may end in further hemorrhage or encephalitis.

When the rallying stage has ended in reaction, rest and absolute quiet should be maintained. One smart purge—5 grains of calomel or half a minim of croton oil—may be given. Where these are contra-indicated, a copious warm water enema may be substituted. The patient should lie in a darkened room upon his back, with the head elevated and the hair removed, with ice or Leiter's tubes applied to the scalp in severe cases.

Leeching, wet cupping, or venesection may be demanded in plethoric subjects with much mental excitement. Alcohol, opium, and animal food are to be forbidden, the diet consisting entirely of milk, diluent drinks, and harmless slops. The use of even beef-tea is sometimes followed by an increase of headache and a rise of temperature, and a pure vegetarian diet should be insisted upon for a considerable time after the symptoms have subsided. As the symptoms of reaction and the excitement subside, the maintenance of rest and quiet for ten to twenty days generally leaves the patient well, unless serious cerebral damage has occurred.

In those cases where the original injury was caused by a bad fall, or by the blow of a large, heavy object, the general contusion of the brain which results may end in fatal collapse.

It is not often that surgical measures are indicated in this class of cases, as the diffused injury to the brain, if not relieved by the above treatment, will not be at all likely to yield to operative interference. Should, however, the symptoms of encephalitis follow reaction and end in signs of cerebral abscess, and if the pus can be localized, trephining may be determined upon with some prospect of success. Such a procedure is only to be undertaken in this class of cases after the gravest deliberation and analysis of symptoms. *Local* brain symptoms, in cases of general shaking or severe brain contusion, may be present merely as part of the *general* brain injury, which of itself will be sufficient to produce a fatal issue, even after the local trouble has been successfully dealt with.

Bryant advises local interference only in local injuries, but recent results prove that the inflammatory effusion and abscess following gen-

eral cerebral contusion or laceration may be dealt with successfully by trephining.

In those cases where the injury is localized, as in blows, and wounds produced by sharp instruments, or by any force acting upon a circumscribed area of the skull, and causing fracture of the cranial bones, with or without depression and associated with local brain symptoms, the line of action is clear. Depressed bone should be elevated without delay. Blood effused underneath the site of injury and causing compression symptoms should be removed by trephining.

Authorities differ regarding the wisdom of elevating depressed bone when there are no symptoms of compression. Recent experience points strongly to the advisability of not waiting for signs of compression or irritation. Considering the cases in which the physician finds symptoms of local convulsions following long after circumscribed cranial injuries, there should be no hesitation in following Macewen's advice.

He states that when there is marked depression of the skull, involving both tables, it ought to be elevated without waiting for the development of symptoms of compression or of irritation, provided the surgeon has the means of preserving the wound in an aseptic condition.

The use of the trephine in fractures of the base of the skull has not been much practised. Warren has given some instructive cases where trephining was successfully performed with the view of *affording drainage*, the cribriform plate being drilled for this purpose. He recommends trephining above the external auditory meatus in fractures of the temporal and sphenoid bones and those involving the anterior fossa, and he selects the occiput below the superior curved line, with the view of draining the posterior fossa.

In a fracture involving the vault of the pharynx, he recommends trephining a little anterior to the auriculo-bregmatic line, and the insertion of a drain of antiseptic gauze along the floor of the skull in the route of the fissured bone.

In fractures of the base, it is of vital importance that the avenues through which septic matters may be introduced should be guarded, thus irrigation and insufflation of the nostrils, ears, pharynx, and Eustachian tubes should be carefully attended to by means of sprays of weak corrosive sublimate (1 : 1000) or of carbolic acid (1 : 100), and the packing of the ears and nose with iodoform or other antiseptic gauze.

HEARTBURN—See Dyspepsia.

HEART, Dilatation of.

This may be a sequel to valvular lesions, and indeed is often the condition which tempts the subject of valvular disease to seek the advice of the physician. Under these conditions the treatment for failing compensation—*i. e.*, cardiac tonics and rest, with attention to the

bowels, kidneys, skin and liver—will meet all the requirements of the case.

Similar treatment will maintain in those cases where the dilatation has been brought on by severe prolonged muscular exercise or heavy mental or emotional strain. Broadbent points out the necessity of relieving the ventricles of work, and giving them strength, while at the same time measures are employed with a view of depleting the venous engorgement.

Rest and cardiac tonics fulfil the first indications, while mercurial and saline purgatives accomplish the second. Often cardiac tonics fail in giving relief until the balance of the circulation is restored by draining the portal system. The after-treatment will then practically resolve itself into the judicious exhibition of the various agents indicated in cases of advanced valvular disease associated with failing compensation. The hypodermic injection of strychnine is invaluable at the beginning of the treatment.

HEART, Functional Affections of.

Where an organic cause for cardiac disturbance exists, embarrassed respiration, palpitation, pain, and irregularity of action may demand prompt treatment. One or all of these symptoms may be present, and the treatment should be directed to the relief of the paroxysmal attack in the first instance, and secondly, to its prevention during the intervals, and thirdly, to the continuous treatment of the case in those subjects where the symptoms are more or less constantly present.

Under Goitre Exophthalmic, and under Angina Pectoris, the management of these affections are described.

Attacks of severe functional disorder should, if possible, be referred to their source before effective treatment can be directed against them. Thus, an overloaded stomach, or an attack of acute dyspepsia, may produce alarming cardiac symptoms, which may be best treated by prompt evacuation of the gastric c ntents. Any rapid accumulation of gas or fluid in the abdomen may cause such displacement of the diaphragm as may lead to serious cardiac embarrassment, and when possible the cause should be remedied at once.

In attacks depending upon intrinsic causes, as altered innervation, etc., the best remedies will be stimulants, like ammonia, ether, brandy, and in hysterical females, asafœtida, valerian, musk, or sumbul, while the paroxysm is severe.

Ice or cold applied to the cardiac region, sometimes gives relief, but where there is marked irregularity or intermittent action this is not a safe practice. The same remarks apply to galvanism and faradization of the vagus of the neck.

A little ether, inhaled from a sponge or inhaler, is safer than chloroform, and where there is increased arterial tension nothing gives such marked relief as a nitrite of amyl capsule or a nitro-glycerin tabloid.

Ammonia or strong acetic acid, or even strong snuff to the nostrils, sometimes gives speedy relief.

Aconite is recommended, but it may do mischief unless there be marked hypertrophy present. Veratrum viride is open to the same objection.

Digitalis is generally useless when given to relieve a paroxysm, and bromide of potassium is also quite too slow in its action. Chloral hydrate is of much value, but should not be given if there be a reasonable suspicion of organic disease, and if administered at all it should be given with a moderate dose of whiskey.

Warm carminatives, like the strong tincture of ginger, may be added to the ammonia or ether with advantage, and a cordial like the following will generally prove speedy and efficacious:

℞.—Spt. ammon. aromat. ℥j.
Æther. fort. ℥ij.
Tinct. zingiberis ℥v.
Ol. menthæ pip. ℥j.
Spt. camphoræ ℥iij.
Tinct. card. comp. ad ℥iij.—M.

S.—Take a small teaspoonful in a wineglassful of water every fifteen minutes while the palpitation and difficulty of breathing are severe.

A firm, decided expression of opinion upon the safety of the patient's prospects of relief, often acts like magic in those cases where the attack originates in or is aggravated by mental or emotional causes. Balfour lays stress upon the importance of noticing the effect of exertion; if this does not increase the palpitation and uneasiness, the case may safely be regarded as functional, and when the physician is certain that the patient's heart is not the seat of organic disease, this clear statement has a very decided effect upon reducing the frequency and severity of the attacks.

In the intervals between the attacks everything tending to depress the nervous system must be avoided, late hours especially, with excess in the use of tea, tobacco, and alcohol, and sexual excitement should be given up. Regularity in meals and in taking open-air exercise is of importance, as is also the avoidance of anything like brain over-work or high business pressure. This latter is of great importance, as functional disturbance may ultimately end in organic lesion if these causes be continued.

Every departure from the highest standard of health must be sedulously attended to—anæmia met by iron and arsenic; plethora by exercise, saline purgatives, and corrected dietary; dyspepsia by appropriate remedies; sleeplessness by sulphonal; uterine ailments by local and general medication. Where the paroxysms have been caused by prolonged muscular exercise or overwork, absolute rest is imperative. Of drugs there are several which have been highly recommended for

administration during the intervals between the attacks, after the correction of any disordered condition which may have been present.

Digitalis is the most potent of these, and its administration has been recommended upon high authority as a remedy for palpitation of a purely neurotic character. The writer has not only seen it fail in many cases, but he has found it to aggravate the condition sometimes. Unfortunately there are no means by which its value can be decided in a given case until it is tried; its effects should be closely watched, and its administration stopped after two weeks' trial if not satisfactory. The dose should not exceed 5 minims of the tincture.

Bromide of potassium, in some instances, prevents attacks, but the writer's experience of its use leads him to believe that it should not be given for long periods without intermissions, and in these intermissions digitalis can be sometimes given with great advantage.

Belladonna in minute doses, and strychnine in small doses have occasionally given good results, and iodide of potassium, 5 grains three times daily after meals, often affords the best results after failure of everything else. Antipyrine (5 grains) may hit where the beforementioned drugs have failed.

The writer has obtained much more uniformly successful results from the syr. ferri quininæ et strych. phos., in drachm doses, than from any other remedies except the iodides, and he believes it to be the best routine treatment in simple or neurotic palpitation. Should there be any obscure organic lesion present, it cannot do harm and it is likely to do good. His plan is to give it for one month, and then to add 2 minims of the tincture of strophanthus (1 : 20) to each dose while the treatment is continued for another month, after which the plain syrup is to be continued. The following mixture may be given:

℞.—Acid. hydrobrom. dil. ℥vj.
Tinct. belladonnæ ℥ij.
Tinct. nucis vomicæ ℥ij.
Glycerini purif. ℥jss.
Tinct. aurantii amar. ad ℥vj.—M.

S.—A dessertspoonful in half a wineglassful of water three times a day before meals.

Barium chloride may be given where cardiac pain is marked. The dose should not exceed ½ grain in pill or solution every eight hours.

In those cases characterized by great frequency in the action of the heart, and known as instances of the "rapid heart," the above agents may be tried, often with benefit, but Sansom has shown that, in the really severe cases, treatment produces no effect. He particularly recommends the application of the continuous current over the region of the great nerve centres. (For Fainting, see Syncope.)

HEART, Fatty Degeneration of

Excluding those cases where this condition supervenes upon typhus, typhoid, or other fever, or wasting diseases, or phosphorous poisoning,

where speedy recovery follows the removal of the cause, and the administration of iron, stimulants. rest, and concentrated food, there remain those examples of the disease coming on, for the most part, in advanced life.

Fatty degeneration appearing as the last scene in the progress of valvular lesions falls under the treatment suitable to these affections. Only the management of the disease occurring as a true senile degeneration, or resulting from disease of the coronary arteries, need be here narrated.

Being essentially an error of malnutrition the first indication should be to correct every error in living, and to prevent the slightest violation of any health law.

The diet should consist of wholesome concentrated food in moderate amounts administered at regular hours and frequently ; long fasts and hearty meals, especially late and hearty dinners being strictly forbidden. Well made strong beef-tea being an excellent cardiac stimulant, may be given between meals with advantage. Alcoholic stimulants are to be used in the smallest quantities, and are better avoided entirely except as medicinal agents at times of fainting or threatened collapse. Their moderate use as beverages generally does harm.

Tobacco is injurious. Regular hours are essential; "early to bed and early to rise" is a good rule. Purity of air breathed while asleep or awake is of importance. Where the patient's means and occupation admit of it, he should be advised to spend the most of his spare time in the open air. Carriage exercise is to be recommended only when gentle walking causes fatigue. Climbing or very active work must be given up, rising ground and long flights of stairs are to be avoided, or only attempted with great deliberation.

Everything that worries or annoys, and indeed all forms of brain work liable to produce excitement or exhaustion are to be cautioned against, and occupations or recreations conducive to quiet and contentment should be recommended. By these means life may be prolonged without drugs.

Remembering the danger of a fatal syncope supervening, rapidly diffusible stimulants like ammonia (sal volatile), whiskey, or ether should be within the reach of friends or attendants, and should be administered in diluted form after the horizontal position is adopted. Nitrite of amyl may be useful. For these emergencies a mixture like the following is of use:

℞.—Spt. æetheris ℥j.
Tinct. belladonnæ ℥ij.
Spt. ammon. aromat. ℥j.
Tinct. zingiberis ℥vj.—M.

S.—A teaspoonful to be taken in a wineglassful of water when the difficulty of breathing or palpitation is severe.

Where cardiac collapse and breathlessness do not soon pass off a hypodermic of 2 minims of liquor atropine (1 : 100) may be given.

Of drugs intended to strengthen the muscular fibre many have been highly recommended for constant administration upon empirical or rational grounds. In cases of pure fatty degeneration of the heart uncomplicated by valvular lesion, hypertrophy or dilatation, the ordinary cardiac tonics—digitalis, strophanthus, sparteine, convallaria, etc., are practically useless, and *may* do some mischief.

Phosphorus and arsenic—drugs which in large doses cause fatty degeneration of the heart—have been praised. The writer has never seen any decided benefit follow their use, and he has ceased to prescribe them. Ergot is of doubtful value, but iodides are of very great use, especially in those cases associated with pain and cardiac distress.

Iron and strychnine, if tolerated, are not open to any objection, and may be freely administered with a fair prospect of success.

Quain speaks highly of the dialyzed iron, and his authority upon any point in the treatment of this disease should be final.

Easton's or Fellow's syrup may be taken for long periods with advantage, and cod-liver oil, with Kepler's malt extract, may be given at the same time.

General massage would appear upon theoretical grounds to be worthy of a trial, and the writer has resolved to give it a fair trial when a suitable opportunity occurs. Galvanism, which has been recommended, is an agent which the wise physician may well hesitate to employ until we know more about its effects upon the healthy heart.

The condition of the skin, kidneys, bowels, and all the excretory organs is of vital importance.

Fatty growth on the heart, or fatty infiltration, is a condition though widely differing from the above, nevertheless should be treated pretty much upon the general principles just enumerated for fatty degeneration. Dietary being, however, a matter of the most important consideration, the reader is referred to the remarks under obesity. Oertel's method, consisting of a combination of diet and exercise treatment, in which mountain climbing is a prominent feature, has given excellent results in some cases. It will be referred to under valvular lesions of the heart and under Obesity.

HEART, Hypertrophy of.

In the Lumleian Lectures, Broadbent ably puts the question of treatment in this condition in a nutshell when he says: "The treatment of hypertrophy as such has always appeared to me to be out of place."

The symptoms which may strike the student as calling for remedies are often or irregular or painful palpitation, præcordial distress, etc., and these, even in aortic obstruction with enormous hypertrophy, may be but evidence of the beginning of failing compensation, and the agents demanded are not sedatives, but cardiac tonics and rest. Belladonna

plaster applied and worn over the cardiac area is always a safe anodyne under nearly all circumstances.

In those rare cases of hypertrophy not associated with valvular affection small doses of atropine have been used, but this agent is not to be pushed if it fails to give speedy relief. Where there is fibroid degeneration or contraction of the kidney, the only sound plan to pursue is to treat the primary affection by increasing every possible means of producing elimination of the retained excrementitious products allowed to accumulate in the system, and to cause contraction of the capillaries and small vessels.

HEART, Valvular Lesions of.

There is hardly any department of treatment requiring more serious study than that of the management of cardiac valvular diseases. There is none where a close attention to details will better repay the practitioner. His experience is, indeed, limited, and his treatment of these cases unsuccessful, who cannot at once call up instances where he has seen life prolonged for many years, and where he has felt that by the judicious use of remedies patients have been "called back" from the brink of the grave.

Under endocarditis is mentioned the treatment of the condition out of which the valvular affection arises. After recovery from the rheumatic attack and its cardiac complication, the value of prolonged rest is insisted upon as the best hope of preventing permanent valve mischief. Iodide of potassium at this time may be hopefully administered.

If after a time, when the patient has returned to his usual occupation, the physician finds that the permanence of the murmur tells that obstruction or regurgitation has resulted, the question of treatment crops up. There is some danger that an error may be committed at this stage. The appreciation of the mischief and danger of dosing every patient in whom a cardiac murmur is audible marks a distinct advance in cardiac therapeutics. Nevertheless there are not wanting signs which show that the pendulum has swung too far. If the dictum holds good that cardiac tonics should not be prescribed until failing compensation is evident, then, of course, nothing should be done in the early stages. This is true in the great majority of cases coming under the eye of the physician for the first time, but occasionally he meets with symptoms clearly indicating that the ventricle has not yet sufficiently responded to the extra demands made upon it. In other words, the case falls under his observation before compensation has had time to occur. He will probably find in such cases that the patient has resumed his usual avocation too early, or that there may be some serious error in nutrition.

The treatment of such a case must be carried out by the judicious use of cardiac and other tonics, with rest. The condition closely resembles that of a patient who had long been the subject of a valvular

lesion, and in whom compensation is beginning to show signs of failure. The præcordial pain, palpitation, and breathlessness may be regarded as indications for treatment just as if occurring in an old case. Their management will be considered when describing the treatment of failing compensation presently.

As a rule, however, the victims of valvular lesions do not chance to come often under the notice of the physician at this early stage.

Frequently, in the course of a routine examination, a regurgitant or or obstructive murmur is discovered in a patient who is hardly conscious that he has a heart, so perfectly has the hypertrophy enabled the ventricle to meet the demands made by increased resistance. It is now accepted as a general rule, and there should be few exceptions to it, that the exhibition of cardiac tonic is not only uncalled for, but may do serious mischief in such a case. Indeed, it has been stated that the greatest misfortune which can overtake such a patient is to fall into the hands of a physician, and it cannot be doubted that often ignorance is bliss under such circumstances.

To remove the diseased condition is obviously an impossibility in the present state of our knowledge and with the present resources of our art. Were such a result attainable it would be a serious question to decide upon disturbing the perfectly-balanced compensation. Consequently, the most that one is justified in doing is to consider what steps, if any, are necessary to maintain the perfect adjustment. A little reflection will show that the adjustment will probably be best kept up by a continuous adherence to those rules or habits under the influence of which such complete compensation has already developed. This should be the key-note to our advice and management of the case. Nevertheless, the physician should make minute inquiry into the habits and mode of life led by the patient. It is just possible that compensation has taken place, in spite of the violation of some law of health, and that continued transgression may be certain to ultimately induce failure as the patient gets older. Hence, errors are to be judiciously sought for and wisely remedied without exciting the alarm of the patient, who should not be led to regard himself as an invalid or a cracked pitcher which every contact with the rough world may shiver into fragments.

Temperance in all things is essential to a prolonged career under such circumstances. Excess in alcohol and tobacco, sexual excitement, severe business high pressure, mental over-strain and worry, and prolonged severe muscular exertion should be avoided. A fair amount of muscular exercise is not only unobjectionable, but is really essential, in order to keep the cardiac muscle in a healthy condition. The physician is more liable to err in limiting than in encouraging the necessary amount of exercise. Walking may safely be indulged in to any reasonable extent. Even mild gymnastic exercises are productive of good under certain restrictions. Short spurts of running, lifting heavy weights, and violent quick movements are to be forbidden.

Everything likely to maintain a high standard of health should be advised, and a good liberal mixed diet prescribed, such as experience has proved to the patient to be most acceptable and sustaining. The writing out of a diet table for the subject of a valvular lesion in which compensation has taken place is a mistake. As far as possible, the patient should be guided by his own instincts and experience in eating, avoiding much tea and all indigestible substances.

The earliest symptoms of failing compensation should be looked for with a watchful eye by the physician. They are the real indications for active treatment, and early failure of compensation generally is easily remedied. Perhaps this is the best example furnished by practical therapeutics of the truth of the adage that "a stitch in time saves nine."

Palpitation, cardiac pain, breathlessness, dyspnœa, anæmia, blueness of the extremities, œdema of the feet, passive congestions of the liver, stomach, intestines and kidneys, and slight albuminuria are to be regarded, not as so many different symptoms, each requiring its specific remedy, but as the direct outcome of one cause, which requires remedying.

Before mentioning the different drugs which may be used to strengthen and build up again the debilitated muscular walls of the dilated ventricle, it may be advisable to consider other important aids to treatment, as diet, exercise, etc.

The exact value affected and the nature of the affection, whether resulting in obstruction or regurgitation, are of comparatively minor importance, the secondary changes in the cardiac muscle and in the ventricular cavities demanding primary consideration.

Diet should be of the most nutritious and sustaining character, consisting of a fair amount of nitrogenous food, with small proportion of fats and saccharine matter. It has been pointed out, in detailing the lines for the management of cases of valvular lesion in which complete compensation has taken place, that there is a serious objection to prescribing a fixed diet or bill of fare. In the treatment of the cases now under consideration there are stronger reasons why this should not be allowed. A theoretically constructed diet table for failing compensation is very good upon paper, but at the bedside it is of little use.

Dyspepsia depending upon passive congestion of the gastric mucous membrane is a pretty constant early symptom, and it resents attempts to sustain life by obedience to hard and fast lines. For this reason rectal feeding is of vital importance in many cases.

Leube's bland nutritious enema suits such cases well. One and a half ounces of muscular fibre is beaten into a smooth paste, with ½ ounce of finely-chopped pancreas free from fat, in a warm mortar, with a little lukewarm water to give suitable consistence. The whole may be injected every six hours. Peptonized beef tea or Roberts's peptonized milk gruel may be used. Cold milk is added to an equal

quantity of thick oatmeal gruel, at a temperature of 212° F. About three-fourths of a teaspoonful of liquor pancreaticus and 5 grains of bicarbonate of soda are added to 5 ounces of the mixture.

Sansom recommends an easily-prepared enema, consisting of 2 ounces of warm milk shaken up in a bottle with 1 ounce of cod-liver oil. He says: "I feel sure, from my experience, that lives may be prolonged and crises tided over by such supplementary alimentation"—a statement that the writer's experience has proved true.

The most convenient of all methods of rectal feeding, when expense is no object, is the use of a good nutrient suppository. It is, of course, understood that rectal feeding is only to be employed in those advanced cases where the patients are unable to eat and digest. In the case of children, excellent results may be obtained by the inunction of cod-liver oil over the abdomen.

Oertel has introduced a method of treating failing compensation by a combination of diet and exercise, which may be now referred to. Exercise was formerly considered as contra-indicated. The introduction of this treatment may be regarded as a protest against the practice of enforced rest in chronic valvular lesions. Oertel tried it first in cases of fatty heart associated with general obesity, and his results were so striking that he applied the treatment to valvular lesions.

The rationale of the plan is based upon the rather doubtful assumption that the blood in these cases contains an undue proportion of water. Hence he believes, if this can be removed by a diminished supply and increased excretion, the work which the heart is called upon to do and the congestion of organs will be lessened. Of all the methods for increasing the elimination of water, he has proved that none equal *mountain climbing*. About one quart of water, he found, was excreted by the skin and lungs after an ascent of over 1000 feet, made in a climb of rather less than four hours, the urine not being materially altered in quantity. At the same time, the heart is stimulated to more forcible contractions, and the muscular exercise has powerful influence, through the relations of the great veins to the fascia, in quickening the venous and arterial circulations. The result is, that in the long run a genuine and healthy hypertrophy of the cardiac muscular fibre takes place.

The quantity of fluid ingested he reduces to an amount under one quart daily, inclusive of that contained in the solid constituents of the food.

The diet should be highly nitrogenous, consisting chiefly of proteids, with a little fat and a limited amount of carbohydrates.

He lays down a strict diet table, in which the total food for the twenty-four hours amounts to about: 5½ ounces of albumin, 1 ounce of fat, 3 ounces of carbohydrates, 35 ounces of water.

Of the 35 ounces of water a little less than half is contained in the

solid food, and a little more (about 1 pint) is to be given as drink. Thirst may be relieved by frequent gargling with water.

The following is a summary of the articles included in such a diet, with the approximate quantities in English weights and measures:

Morning meal: Coffee 4½ ounces, milk 1 ounce, sugar 77 grains wheaten bread 1¼ ounces.

Mid-day meal: Soup 3 ounces, roast or boiled beef, or veal, or game, or lean poultry 7 to 8 ounces, fresh salad 1 ounce, bread 1 ounce, never to exceed 3 ounces, fruit 3 to 6 ounces, a little fish if desired. Light wine, 6 to 8 ounces if no fruit or if very hot weather otherwise no fluid with this meal.

Afternoon meal: Coffee 3½ ounces, milk 1 ounce, sugar 77 grains, water 2 ounces, never more than 6 ounces, bread 1 ounce (exceptionally).

Evening meal: Wine 7 ounces, water 2 ounces, 1 or 2 eggs, roast meat 5 ounces, salad 1 ounce.

Since the above dietary is intended for those cases of fatty heart associated with obesity, its use is a serious mistake when applied to cases of ordinary failing compensation in which obesity is not a prominant symptom. It is inserted here to give a bird's-eye view of Oertel's plan of practice. (See under Obesity.)

This method has been received by different authorities with very varying degrees of favor or hostility. The writer has had no experience of its working whatever, though he has had ample proof of the benefits of moderate exercise and very mild gymnastics in failing compensation.

From a very careful study of the experiences of others it would appear that in selected cases it is a valuable addition to cardiac therapeutics. The cases in which it gives best results are in very fat subjects, in the anæmic, and in those complicated with gout, as pointed out by Sansom.

Recently Oertel has admitted that it should not be attempted where there is very serious incompetence of the cardiac muscular fibre, or where there is atheroma, nor should it be persisted in where dyspnœa is increased, or the excretion of urine diminished under its use.

Modifications of the plan may be carried out by regulating the diet so as to materially diminish the amount of fluids consumed, and to increase the amount of urea and water eliminated by means of the hot-air bath, hot packs, and hypodermic injections of pilocarpine, combined with the use of the cardiac tonics to be presently mentioned.

If to these be added systematic and judicious muscular exercise upon level ground, and a careful and thorough course of massage, all the benefits of Oertel's treatment, without its serious dangers, may be procured. In concluding this portion of the description of the management of failing compensation, the writer would venture to suggest that unless the physician has had a very extended experience in the treatment of valvular lesions he will be wise in refraining from pre-

scribing Oertel's practice without sharing some of the responsibility with a medical brother.

The plan of massage and hot douches, as practised at Aix-les-Bains and recommended by Sansom, has been productive of much good in the experience of the writer, who has had patients return very much improved after a short course of Dr. Blanc's treatment,

Karell's absolute milk diet treatment has been carefully tried at the Dorpat Clinic, with results meriting some confidence in cases of advanced failure of compensation. After a few days upon a diet consisting *exclusively* of milk the following results began to come under notice, and continued for months: The quantity of urine rapidly increased, albumin diminished and disappeared, the pulse rate fell to normal, congestions faded away, and the general condition surprisingly improved. Upon a diet consisting *principally* of milk the patients were found to gradually go from bad to worse; so that if this treatment is to be tried, no other food whatever should be given. Milk in small quantities, given at short intervals, must be persisted in for some time until the ingestion is carried to the fullest possible extent. In a few cases in which this method was tried by the writer it did not prove satisfactory, and had to be abandoned owing to gastric complications. It would, however, be well to give the plan a further trial in those cases where cardiac tonics cannot be borne, and to combine with it a thorough course of massage.

Treatment by drugs.—After evidence of failing power in the cardiac muscular fibre has been established, the question of the administration of cadiac tonics should immediately suggest itself.

One point may be here mentioned, the consideration of which may save the physician from falling into a not uncommon error. Remembering that a patient (in whom perfect compensation may exist) lives in a state of not very stable equilibrium, the transitory disturbances caused by severe mental emotions or other trying causes should not be mistaken for the onset of permanent failing compensation. In aortic disease especially, such passing disturbances may give rise to painful palpitations and distress where great hypertrophy exists. The passing symptoms in such cases would probably be aggravated by digitalis and other cardiac tonics. Sedatives like aconite, veratrum viride, bromides, or iodides afford marked relief. Their use should not be continued for any length of time. The permanence of the symptoms points to loss of muscular power rather than to altered innervation, and then cardiac tonics are called for.

A combination like the following gives speedy relief where there is a strong hypertrophy:

℞.—Tinct. aconiti ℳ xij.
Potassii bromidi ʒ ij.
Spt. æther. nitrosi ʒ v.
Aquæ camph. ad ʒ iij.—M.

S.—A teaspoonful to be taken every two hours.

When palpitation, præcordial pain, breathlessness, pulmonary or other congestion, and commencing œdema show themselves in chronic valvular lesions, cardiac tonics should be given wihout loss of time.

Digitalis, notwithstanding the introduction of a host of rivals, at present stands, and probably for all time will stand, as the most reliable member of the group of cardiac and vascular tonics. By acting as a stimulant to the cardiac fibre, it produces slower and stronger contractions, allowing the left ventricle to drive a larger volume of blood into the aorta at each stroke. At the same time it causes a more perfect adaptation of the segments of the mitral valve by lessening the size of the orifice. It prolongs the diastole, thus permitting the more complete filling of the ventricle in mitral stenosis, and at the same time it strengthens the power of the auricle. The prolongation of the diastole benefits the circulation in the cardiac fibres and improves their nutrition.

Wood regards digitalis as a heart food and tonic, and not as a cardiac stimulent. According to Romberg's new views about the importance of regarding the myocardium and not the ganglia as the automatic motor of the circulation, we must come to the conclusion that the drug acts strongly upon this portion of the cardiac apparatus also.

By causing increased contraction of the small arteries and capillaries, digitalis raises the blood pressure and so affects the lymphatic and venous circulations as to exert a powerful influence upon dropsy. Through its effect upon the vessels, it also acts as a powerful diuretic, and may be made to cause enormous increase in the amount of urine secreted, especially when the patient is almost "water-logged."

These valuable actions of digitalis may be successfully employed in valvular lesions with failing compensation, and by its intelligent use life may be prolonged for indefinite periods under conditions of comparative comfort.

The old notion that this drug acted as a cardiac sedative still to a very limited extent survives, and has been a serious impediment to successful treatment. Its haphazard administration has sometimes led to bad results, nevertheless the following statement made by the writer in an address a few years ago does not say too much for the remedy:

"When I first commenced the study of medicine I remember well my introduction to foxglove, which even at that recent period was regarded as a narcotic, and its virtues were impressed upon me with all the dogma of authority, especially its great power as a cardiac *sedative*. I was informed and taught that it would subdue a Hercules, and was of great value in weakening the pulse and soothing the heart when it was acting too strongly but that it was dangerous, and should not be used when the pulse was weak and irregular. We now understand its action, and employ this drug daily as a cardiac tonic in imperfect compensation, watching its influence upon the cardiac ganglia, meas-

uring its effect upon the lengthening of the diastolic pause, and observing how the wearied cardiac muscle gains new life and vigor by the increased coronary nourishment administersd during the prolonged diastole. Though often we may be puzzled and disappointed, owing to the many complex disturbing influences at work, still constantly we shall find cases in which we can use this tried and faithful weapon with an accuracy approaching the mathematical."

From these remarks it will be seen that the dose of digitalis will vary somewhat according to the condition of the patient and the nature of the lesion and other considerations to be mentioned.

Various opinions prevail regarding the relative values of the different preparations of the drug. The tincture of the U. S. P. (1 grain in $6\frac{2}{3}$ minims) is the most convenient form, but where a purely cardiac tonic effect is only required the infusion is to be preferred.

The tincture, however, has the great advantage of being more powerfully diuretic, and as dropsy is a very constant feature in the late stages of failing compensation, the tincture is the best preparation in the majority of instances.

Owing to the danger of accumulation taking place the action of the drug should be watched for a week or two with care. As a rule in moderate doses (5 to 10 minims) it may be administered for years without producing any unpleasant symptoms. As long as the quantity of urine excreted is of fair amount the drug is eliminated by the kidneys, and its cumulative action is not experienced. Where large doses are considered necessary the patient should be kept in the horizontal position, and the administration should be stopped as soon as the blood pressure rises so high as to seriously diminish the amount of urine.

Iron may be combined with digitalis nearly always with marked advantage, as anæmia is commonly present. The combination is not an elegant one owing to the incompatibility of its tannin, but it is nevertheless a valuable therapeutic mixture:

℞.—Tinct. digitalis ℳclx.
Tinct. ferri chlor. ʒiij.
Spt. chloroformi ʒij.
Glycerini purif. ʒj.
Aquæ destil. ad ℨiv.—M.

S.—A teaspoonful in a wineglassful of water three times a day after meals.

The relative value of digitalis in the different valvular lesions may be briefly stated.

In mitral regurgitation, the effects of the drug are seen to best advantage. As already stated, it lengthens the diastole, and gives a longer period for cardiac repose and nourishment of the muscular fibre. It diminishes the size of the mitral orifice, and ensures the more complete filling and subsequent emptying of the ventricle into

the aorta. By its similar tonic action upon the right ventrile, it enables it to overcome the increased resistance to the pulmonary circulation, and lung congestion disappears. The increased ventricular power thus gained, together with its tonic effect upon the vessels, reduces the pressure in the venous system, and dissipates the general congestion of organs and dropsy. The blood pressure rises, and the pulse slows, while it gains in force and regularity.

In mitral stenosis, the action of digitalis is not so satisfactory. The experience of the writer in hospital and private practice has led him to believe that mitral stenosis without regurgitation is a comparatively rare affection. In the great majority of cases the narrow chink or funnel-shaped mitral orifice permits of regurgitation. In considering such cases, it becomes a question of the degree of obstruction and its relation to the accompanying regurgitation. Is there more of obstruction than of regurgitation in the affection? He has come to a conclusion that may be formulated in the following therapeutic rule: In proportion to the extent of the obstructive lesion, so will the effect of digitalis be disappointing; and, conversely, the more regurgitation taking place, the more improvement may be expected from digitalis.

In pure obstruction the drug often cannot be tolerated, and though sometimes it appears to strengthen the dilated auricle, and by lengthening diastole to give the blood a longer time to flow through the narrow valve, nevertheless it may increase irregularity of the pulse and cardiac distress. It should, however, be given in every case a fair trial, and, after failure, other cardiac tonics may be tried.

In aortic obstruction, if digitalis be given too early—*i.e.*, before failure of compensation has taken place—very serious disturbance may be caused by it, owing to the enormous hypertrophy commonly present. Where there is marked failure of the enlarged ventricle to drive the blood through the narrowed aortic valve, digitalis acts sometimes like a charm. It may always be counted upon in such cases, but more care is needed in its administration than if the affection was mitral regurgitation.

After the ventriular strength has been restored and compensation again adjusted, the use of the drug should be stopped. It may, however, be again commenced as soon as evidence points to ventricular weakness, the prolonged, continuous rise in blood pressure being undesirable in aortic stenosis, owing, as suggested by Bramwell, to the risk of rupture of the diseased peripheral vessels.

In aortic regurgitation, the case is not so easily made out in favor of digitalis, and there are still sharp differences of opinion regarding the benefits and dangers of the drug in this affection.

Brunton, with his usual clearness and force, has ably defined the indications and contra-indications. He points out that, owing to the diseased valves failing to close in diastole, the arterial system is open at both ends, and thus a fatal syncope may be induced by a fall in blood pressure. This occurs in a small percentage of cases, and the

tendency to it cannot be wisely overlooked. Anything which prolongs the period during which the backward flow of the stream into the ventricle is taking place increases the danger of syncope. Hence digitalis, by prolonging the diastole, may increase this danger. He points out how such danger may be minimized during the administration of the drug, by insisting upon the patient keeping in the horizontal position, with the head lowered.

When, however, the change in the left ventricle proceeds so far as to permit of mitral regurgitation by imperfect closure of the mitral curtains, digitalis is called for. Where mitral regurgitation takes place from the first through structural alterations in the auriculo-ventricular valve, the drug gives excellent results.

Again, in cases of pure aortic regurgitation, without any mitral regurgitation at the later stages, where failing compensation is marked and the pulse becomes frequent, irregular, and weak, the failing cardiac muscle calls for digitalis. Pulmonary embarrassment, breathlessness, congestion of organs, and dropsy disappear under its use. The drug should be discontinued as soon as compensation is thoroughly established.

Fürbringer recently states that he does not know of a single anatomical contra-indication to the use of digitalis.

The other cardiac tonics which have been of late years employed as substitutes or aids to digitalis, are strophanthus, caffeine, casca, convallaria, adonis vernalis, squill, sparteine, chloride of barium, senega, arsenic, and strychnine.

From time to time each of these has been lauded as a remedy certain to displace digitalis; too often the statement has been made upon the experience gained in a few cases in which digitalis has been found to disagree with the patient's appetite or digestion. All one can say is that, in the present state of our knowledge of the relative values of the members of the group, given a case of failing compensation, the first drug to prescribe is digitalis. When it fails strophanthus may be tried, then caffeine and sparteine. Though much has been written upon these drugs, the action of no member of the group has been as fully worked out as in the case of digitalis. Probably the experience of the writer has been that of nearly every physician in this matter. It may be summed up by saying that when in the management of a serious case of failing compensation, pulmonary engorgement and a halting ventricle warn us that unless we come to close quarters with the enemy our patient must succumb, then every other drug is thrown aside and we invariably fall back upon our tried and trusty weapon —digitalis. The serious and pressing nature of the case does not justify one in experimenting with the different members of the group of cardiac tonics, hence the experience at present gained is for the most part accumulated from cases in which these drugs have been administered in the earlier stages of failing cardiac power. The results of

this system of skirmishing "at long range" can hardly be judged side by side with the records of the older cardiac tonic.

There are, however, several well-marked differences in the actions of some of these remedies already worked out by the pharmacologist. Thus strophanthus has little if any diuretic action, certainly it has less diuretic action than digitalis, though some observers have recorded instances where it markedly increased the amount of urine. It acts more powerfully upon the heart than digitalis does, and it has less action upon the arterioles, the rise of blood pressure being nearly all owing to its cardiac action, unlike what happens with digitalis.

The brilliant researches of Fraser have recently shown that the action of strophanthin, in minimum lethal doses, shows itself by great increase in the stength and in the duration of systolic contraction, and the ultimate standstill of the heart in this contraction passing into *rigor mortis*. He points out that this increased duration of contraction, with lessening of the dilatation and capacity of the chambers, is not the action likely to be serviceable in weak conditions of the organ or in the existance of disabling lesions. By giving smaller doses he demonstrated *great* prolongation of the diastolic pause, though the interrupting systolic contractions were strong, and completely emptied the ventricles of their large accumulation of blood. Thus he has solved what would have been a problem frought with enormous difficulties and fallacies at the bed-side *i. e.*, that strophanthus greatly increases the working capacity of the heart, by increasing both diastole and systole through its stimulating effect upon the muscular fibre itself and its influence upon a portion of the intra-cardiac nerve apparatus.

It certainly has this advantage over digitalis, that it does not possess any cumulative action; but it sometimes causes gastric and intestinal disturbances. The following extract, taken from the writer's last edition of *Materia Medica and Therapeutics*, gives his experience of the drug:

"During this period the writer has been using it extensively in hospital and private practice, and closely watching the reports furnished by clinical observers in America and Europe, and these reports in the main correspond with his own observation that, though the drug is a powerful cardiac tonic of great value, it is, upon the whole, inferior to digitalis, and not less dangerous. It is, however, a most valuable addition to therapeutics, especially as it can be given in those cases which one constantly meets with where digitalis cannot be tolerated, and the writer has noticed that this oftener occurs in mitral obstuction, with a very narrow orifice. Moreover, strophanthus is invaluable as a remedy to be given in the intervals, when it is found wise to suspend digitalis, and in those cases where the latter drug causes trouble by its effects upon the capillaries. It will be found a wise and often highly satisfactory plan to give digitalis for two months and then strophanthus, combined with syr. fer. quin. et strych. phos.,

for one month, in ordinary cases of failing compensation. The reports of the drug differ much in details, and this arises from the difference in strength of the preparation used and of the seeds imported. Dujardin-Beaumetz gives large doses, and affirms that the tincture is diuretic, but that strophanthin is not. The dose of strophanthin is 0.002 grain. There are at least four tinctures of the seeds, devised, one should think, to produce confusion. 1. Frazer's original tincture, same strength as digitalis (1 : 8), the dose of which is 2 minims. 2. Frazer's recent tincture, which is the tincture accepted by the B.P.C. (1 : 20), (in this the fatty matter is extracted with ether); dose, 5 to 10 minims. This is now the official B.P. tincture. 3. Bardet's French tincture, (1 : 5); it is green, the fatty matter not being extracted. Dose, 1 minim. 4. Catillon's French tincture (1 : 5) made like, No. 2. Dose, 1 minim. The B. P. tincture should only be used, and in doses not exceeding 5 minims. When the green, inert fatty matter existing in the seeds is not removed the drug excites troublesome gastric derangement."

Professor Frazer's late researches inspire us with the hope that as we become more familiar with the exact therapeutic action and dose of strophanthus, we may be able to so graduate the dose as to prolong systole without lengthening the diastole. When this can be done with safety and precision the treatment of aortic regurgitation will be lifted out of its present rather unsatisfactory position.

Caffeine.—There is still much difference of opinion regarding the cardiac tonic action of this drug, some authorities going so far as to declare that it possesses no digitalis-like action upon the heart, and that its diuretic action is simply owing to its local influence on the renal epithelium. Other observers report very satisfactory results in failing compensation, and the writer believes that he has seen excellent results from the administraion of 3 to 5 grain doses of the citrate in mitral regurgitation, with much anasarca and congestion of organs, where digitalis was not well borne.

One advantage it certainly possesses over digitalis which will continue to give it some position in cardiac therapeutics—*i. e.*, that its diuretic action is more rapid than that of the old-established remedy—an advantage of great importance in some cases where time is of primary consideration.

Convallaria does possess some cardiac tonic powers, but the test of time is telling seriously against its claims as a substitute for digitalis. At present the consensus of opinion is pointing to a rule which is being gradually formulated that the drug should only be tried when digitalis fails.

In mitral stenosis and aortic regurgitation it has often been found to slow the pulse, strengthen the ventricular contractions, relieve dyspnœa markedly, and remove dropsy. It may be given in combination with caffeine in these cases with advantage.

Sparteine produces rapid cardiac tonic effects. It acts in most

respects like digitalis, but is much quicker in its action, and hence where a rapid result is required it may be said to have no rival which is at the same time safe in full doses. Three grains may be given every six or eight hours. Its diuretic actions is markedly inferior to that of digitalis. Given a case of rapidly failing compensation, sparteine may be ordered in full doses immediately, and after a few days, when its affect appears to be on the wane, digitalis may be administered with much benefit. Like all the other members of the group, it may be given with advantage during the intervals in which digitalis is suspended during a prolonged course of that drug.

Chloride of barium has recently been much praised as a cardiac tonic. The writer has had no experience of the drug, and can only speak from the published reports of those who have tried it in failing compensation. These reports in the case of new drugs are more or less neutralized by the experience of the next crop of investigators, but allowing for this the remedy under notice will probably continue to gain confidence.

It possesses power closely resembling digitalis. It slows the pulse very markedly, and regulates its action, raises the blood pressure by its cardiac and vascular stimulation in doses of one drachm of a 1 per cent. solution, which is tasteless and unirritating to the stomach. It has been given in all forms of valvular lesion, and no ill effects have been noticed. Most observers have stated that it relieves cardiac pain, and is a mild diuretic.

Mitchell Bruce, in writing upon the treatment of failing compensation in children, has pointed out the great value of hypodermic injections of strychnine in 1 per cent. solution, which, he states, has in some instances an effect little short of the marvellous in restoring the action of the ventricles. This is a point of the greatest importance since the action of digitalis is slow, and in urgent cases strychnine should be given hypodermically while awaiting the full action of digitalis.

Squill, senega, adonis vernalis, adonis æstivalis, cactus grandiflorus, carduus mariæ, coca, apocynum cannabinum, and many other cardiac tonics have been from time to time used in failing compensation, but it remains to be proved that they possess any advantages over those already discussed.

So many points remain for "clearing up" in the action and therapeutics of the better known members of the cardiac tonic group, that the ceaseless introduction of new rivals is actually becoming a serious barrier to therapeutic progress. At the head of the entire list still stands digitalis, and of all those below it, the most that can be said of them is that they are of value when it fails or disagrees, and that they may be administered with advantage when it is considered wise or expedient to leave off its use for short periods.

Arsenic appears to be of special use where there is evidence of degeneration of the cardiac fibre having taken place to any extent.

It may then be combined with strychnine and iron. Some authorities recommend a combination of the various cardiac tonics at the same time, but the more we know of cardiac physiology the less likely is a conglomeration of crude drugs to meet the indications of the case.

At this place no mention is made of ether, alcohol, ammonia, etc., which are often classified as cardiac tonics, bnt it is needless to say, they possess no such action, being simply cardiac stimulants whose place in medicine is to be administered when a rapid stimulation of the feeble cardiac muscle is required, while other remedial agents are getting time to exert their more permanent influence.

There are various prominant symptoms or complications which often arise during the later stages of valvular lesions, the treatment of which may be briefly referred to.

Bearing in mind that these symptoms for the most part take their origin in the disturbed balance produced by failure in the cardiac muscular fibre, their successful management will generally mean the administration of cardiac tonics. There are, however, other remedies which the physician may call to his aid when the urgency of the symptoms does not justify him in waiting for the comparatively slow action of these drugs.

Dropsy may threaten the patient's life from œdema of the lungs before digitalis has time to act, and the general rules laid down in speaking of the treatment of Bright's disease are for the most part applicable to the anasarca which results from valvular trouble. In the former case, however, the kidneys being more or less crippled in their action, diuretics are of comparatively little avail, and may be even dangerous, while in cardiac dropsy the physician can for the most part count upon their co-operation.

Calomel often acts as a powerful diuretic in these cases, 5 grains sometimes producing very considerable increase in the amount of urine. Occasionally serious prostration has followed its administration, and it should not be given where there is any renal disease.

Iodide of potassium is valuable. It may be combined with great advantage with other diuretics and with digitalis. The following is a good combination:

℞.—Potassii iodidi ℥iss.
Spt. ammon. aromat. ℥iv.
Tinct. scillæ ℥iv.
Tinct. digitalis ℥ij.
Infus. senegæ ad ℥vj.—M.

S.—Take a tablespoonful in water every six hours.

Guy's or Baly's pill, containing 1 grain each of squill, digitalis, and blue mass, is an invaluable remedy where there is no urgency.

Nitro-glycerin, in small and often repeated doses, as $\frac{1}{6}$ minim of 1 per cent. solution every fifteen minutes for four or six hours, sometimes starts the kidneys.

Where the kidneys fail to respond, the bowels may be made the channel for the removal of much fluid. Saline purgatives may be used for this purpose. Hay's method of purging by concentrated solution of magnesia sulphate (see page 77) may be employed where the general anasarca threatens to cause suffocation. Cream of tartar may be used to keep up the effect of the purgative. Pulv. jalapæ comp. is a favorite drug. Puncturing the limbs or tapping the peritoneum may be resorted to. Acting upon the skin, as in Bright's disease, by hot air and vapor baths and pilocarpine, is not satisfactory.

Diuretin, which is a sodio-salicylic compound of theobromine, has been used with great success in the dropsy caused by valvular disease. The dose should be up to one drachm daily—*i.e.*, about 5 grains every two or three hours. It sometimes causes very marked increase in the urine and rapid disappearance of anasarca.

Recently lactose has been praised by Sée as the most powerful of all cardiac diuretics; 3 ounces dissolved in 4 pints of water is made to replace all other liquids. Enormous increase in the urine is said to follow. It should be stopped after ten days and again commenced.

The general visceral congestions are to be relieved by the same means—*i. e.*, by combinations of various diuretics and by brisk saline cathartics. Dry cupping over the chest and loins may give relief.

Pulmonary embarrassment may come rapidly, causing sudden and dangerous dilatation of the right side of the heart from the congestion of the lungs. In such cases life may be prolonged by making a good-sized incision into a vein in the arm and removing 10 ounces of blood. Leeching may be tried, but where the lividity and orthopnœa are sufficient to call for venesection, leeching is of doubtful value. Where leeching has failed, cupping over the bites may do good. Ether and ammonia should be given.

Bronchial inflammations following congestion should be treated by brisk counter-irritants and expectorants while cardiac tonics are allowed time to act. The inhalation of oxygen, and compressed-air baths, have been recommended to relieve the dyspnœa.

Sleeplessness may be met by opiates if the bronchial surface is free. Chloral is doubly dangerous in cardiac cases with a weakened ventricle, but $\frac{1}{6}$ to $\frac{1}{3}$ grain morphine hypodermically often acts most beneficially, and relieves dyspnœa and orthopnœa and cardiac asthma. Paraldehyde and sulphonal are unobjectionable.

Syncope or sudden cardiac failure must be promptly met by ether and ammonia, hypodermically or by mouth. The hypodermic injection of strychnine may be invaluable. Alcoholic stimulants and sparteine should be freely given, and brandy or whiskey may be injected hypodermically or by the bowel.

Hypodermic injection of $\frac{1}{2}$ to 1 ounce of a 6 per cent. salt solution causes rapid rise of blood pressure, which lasts for some hours.

A single induction shock may be tried with advantage.

Cardiac pain is often a troublesome symptom. It is best met with

local applications. Belladonna plaster over the heart affords surprising relief in many cases. This symptom is often associated with painful palpitaions. For the relief of the abnormal cardiac action, accompanied by pain, in old valvular cases there is no remedy equal to large doses of iodide of potassium. The writer has obtained good results from the following combination:

℞.—Tinct. digitalis ℥ijss.
Potassii iodidi ℥iij.
Ext. erythrox. fld. ℥ij.
Spt. ætheris nitrosi ℥j.
Aquæ et glycerini ad ℥iv.—M.

S.—Take a teaspoonful in water after meals four times a day.

Iodide of potassium is a drug of the greatest value for the relief of very many of the distressing symptoms of failing compensation. Germain Sée strongly maintains that it is a true cardiac tonic, superior to all others in dilating the arterioles, diminishing the peripheral resistance, and enabling the heart to recover its contractile power, and, at the same time, greatly promoting its nutrition. Laborde insists upon the iodide of potassium as being the true medicament of the heart.

Where the palpitation is liable to come on in severe attacks, nitrite of amyl or nitro-glycerin (see Angina, page 43) may be used.

HECTIC FEVER.

The first indication is to remove, if possible, the cause upon whose presence in the system the hectic depends. Any suppurating cavity should be freely incised, washed out, and drained. Diseased bone and affected joints should be excised, and every source of suppuration dealt with upon general surgical principles.

Empyema, tubercular lesions of the bowel, lung, and kidney, tend to wear out the patient through the hectic which they produce, and where the cause cannot be removed, the febrile symptoms may be kept in check. Sometimes, if the patient can be kept alive for a sufficient time, the cause of the hectic may wear itself out, and in such a case palliative treatment is of the greatest importance.

The diet should be most sustaining, being given in the most concentrated form at very short intervals, and, of course, in moderate quantities at a time. Alcoholic stimulants may be freely administered, and everything that supports the patient's hopes and encourages sleep, appetite, and digestion must be carefully attended to. Abundance of pure, warm, dry air is of much importance in checking the suppurative process.

The paroxysm of chills, fever, and perspiration can be modified or prevented by antipyretics. Under Phthisis the action of these remedies and the treatment of night-sweating will be considered.

In the early part of the paroxysm during the chilly stage, a little warm stimulant may be given, and when sweating is profuse, the skin may be freely sponged with cold or hot water and vinegar, to which a little tincture of belladonna is added. Before the rise of temperature is expected, a moderate dose of antipyrine or antifebrin (10 grains of the former or 6 of the latter) will effectually prevent the paroxysm altogether, or so modify its intensity as to cause little waste or exhaustion.

In severe and prolonged cases 30 grains of antipyrine may be given, and half this dose, repeated in one hour, if the temperature does not fall; should the fever not yield to the second dose, 15 grains may be given in another hour (60 grains in all).

After a full dose given in this way, a fall from 105° to 97° or 98° may be confidently expected, and the fall may last for twenty-four hours or more. Sometimes rather alarming prostration follows this treatment, but, though the writer has never seen serious symptoms follow, he has latterly given up large doses when the fever is high for small ones given before the expected rise. Under Phthisis the management of this condition will be more fully considered.

Quinine is a drug of great value, and it may be given in 5 grain doses, and, where it checks fever, it may be continued for any length of time.

HEMICRANIA—See Megrim.

HEMIPLEGIA.

Under the head of Apoplexy the treatment of hemiplegia in its first stages has been described. After the patient has recovered in every other respect from the seizure which caused his attack, the only symptoms remaining may be the loss of power in the muscles of one side of the body.

The treatment at this stage must be directed to his general condition; little can be done for the paralysis. The bowels and bladder must be carefully looked after, cathartics or laxatives being necessary in most cases. Drugs are of little use in hastening the disintegration and absorption of the clot upon which recovery depends, active interference being fraught with danger. Strychnine is liable to increase the mischief, and its utility at all stages of the affection is somewhat doubtful. Bromides with iodides may be tried, and at a later stage phosphorus in small doses may be beneficial. The diet should be sustaining but unstimulating, and the less animal food and alcoholic stimulants the better. A pure vegetarian diet with milk is indicated. Mental repose should be maintained. When the patient is able to move about, the natural exercise will improve the nutrition of the affected muscles. For the first month no attempt should be made to stimulate them, but gentle friction cannot do harm. As long as symptoms of cerebral irritation exist, massage and electricity are contra-indicated.

When a couple of months have elapsed, and the only sign of trouble

that is evident is weakness in the affected muscles, massage should be cautiously commenced and fairly tried, and along with it electricity. The current applied to the muscles of the extremities may be continuous or faradic, the latter being used only after a few weeks trial of a weak continuous current. Different opinions prevail about the wisdom and utility of attempting to reach the lesion itself. The writer has seen decided benefits follow the application of a current from 5 Leclanché elements, with one large electrode upon the forehead and the other over the occiput. After a week, the current strength may be doubled, and he has employed 10 cells, causing the current to flow from an electrode placed over the site of the hemorrhage on one side, with the other pole situated over the opposite region of the skull. Free exercise may be permitted, and every factor likely to cause a return of the hemorrhage should be carefully guarded against.

Horsley has recommended the ligature of the common carotid trunk as a prophylactic measure against further hemorrhage in those cases where a slight cerebral hemorrhage has already occurred. (See under Apoplexy, page 53.

HEPATITIS—See Liver Diseases.

HERNIA.

The treatment of abdominal hernia is outside the scope of the present article. Only a very brief account of the management of a few of the many forms commonly met with need be given. Such methods will be mentioned as may be useful when the urgency of the case prevents the medical attendant consulting any of the text-books or standard works on surgery.

Given a case of *recent* hernia in a patient hitherto free from any symptoms or signs of the affection, the first duty of the surgeon should be to effect its reduction. After its return (when reducible) the palliative treatment, by means of a suitable truss, is generally deemed all that is necessary.

To effect reduction, in most cases in which no strangulation has taken place, it is only necessary to place the patient in the horizontal position, when the hernia will generally slip up spontaneously. If not, a gentle application of the taxis will secure this end, after which a neatly fitting truss, to be worn constantly in the daytime, will keep it from descending.

In infants the constant application of a truss day and night will effect a complete cure within a year in the majority of instances of inguinal hernia. It will be well, however, to continue the use of the truss for another year. In adults, however, the truss must be worn for very long periods, and generally for the remainder of life.

Of the varieties of trusses there is practically no end. Any instrument which fits comfortably and effectually prevents the descent of the bowel, without producing pain or chafing of the skin, and which

does not interfere with the free movements of the body, may be regarded as safe. As a rule, the pad should not be of such a shape as will ultimately lead to enlargement of the original opening. This is of much importance in the treatment of infantile hernia. The instrument, in the case of adults, may be removed after retiring to rest, but it should be adjusted before the patient resumes the vertical position. Where the means and opportunities of the patient permit, it will be well to have an instrument specially made and fitted by an experienced instrument-maker. The cheap ready-made trusses are often a source of much trouble and annoyance. It is advisable for the patient to have two instruments. In case of any accident or mishap, the reserve truss may be used. Fatal results have often occurred while the patient has been going about without support during the period that his truss has been under repair.

The measurement for a truss for inguinal or femoral hernia may be made by passing a tape line round the pelvis, less than one inch below the iliac crests, the ends meeting at the hernial orifice.

The utmost cleanliness should be observed, especially in young subjects, and the skin under the pad may be frequently dusted with French chalk or oxide of zinc. A very common mistake is made in forgetting that, owing to the rapid growth of the body in very young subjects, the truss soon becomes too small.

The writer has observed almost complete arrest of development of the testicles from the *continuous* use of tight-fitting trusses—a result which he does not remember to have seen noticed by surgical writers.

Irreducible hernia will require considerable modifications in the shape, form, size, and consistency of the pad suitable to the requirements of different cases. A bag-truss will be necessary for large tumors, while small ones may be treated by a small hollow pad.

Umbilical hernia must be retained in position by a suitable concave circular pad. As these herniæ are very often irreducible, the best method for their treatment will consist in the adjustment of a neatly-fitting abdominal belt, constructed so as to protect and support the prolapsed intestine. In the case of the very common infantile form, a flattish, firm, leather pin-cushion of circular form, without much convexity, and many times larger than the opening, should be placed inside the roller, and kept firmly bandaged over the umbilicus. The insertion of convex, button-shaped pads are to be condemned, as they tend to keep the aperture from contracting. Often a few strips of strapping passed across the opening are sufficient to keep it closed.

When a hernia showing signs of strangulation comes before the surgeon, prompt measures must be immediately undertaken for its relief. It may be down but a few hours when dangerous constriction may have already set in. *Recent* herniæ of any variety, and *femoral* hernia especially, are very dangerous. Old herniæ are not so rapidly fatal, but under no circumstances is time to be lost in dealing with a strangulated hernia.

The bowel must be returned within the abdomen by the taxis, or, falling this, by the operation of herniotomy.

The taxis, with the gentlest pressure, will often be found to speedily reduce the hernia if found soon after its descent, but when symptoms of strangulation have set in for any length of time the taxis is too often a failure. It should be tried in all recent cases, but the utmost gentleness should be maintained. When a hernia has been discovered in a patient suffering from strangulation for several days, the first touch of the surgeon's fingers upon the tumor will convince him that manipulation means further injury of the patient's chances of recovery. Pages might be written upon the dangers of the taxis. Most surgeons are loud in their condemnation of it, and some go so far as to say it should not be attempted except under chloroform, and then only for a few seconds. No rule or rules can be laid down to guide the student in the correct appreciation of how far he is justified in perservering in his attempts to force the knuckle of bowel or omentum back into the abdomen. The conscientious attendant must be left to his own judgment of how far he is justified in persisting in manipulation before seeking the aid of an experienced surgeon.

Unfortunately an unworthy motive may creep in at this time, and though it is not a pleasant duty to dwell upon the petty weaknesses of our nature, nevertheless it is right that the young practitioner should be placed upon his guard against himself.

He may feel that in calling in a surgeon who might probably reduce the tumor at once he may lose the confidence of his patient and of those around him. This sometimes tempts him to prolong his efforts at the taxis until serious damage is done to the contents of the sac.

It is much better to take the patient into his confidence, explain the exact situation and its dangers, and seek the aid of an expert without loss of time. In hospital cases it has been often the experience of the writer to find that the taxis has had an exhaustive trial at the hands of several industrious performers before admission. In such cases it is sometimes wonderful to see how little injury has been inflicted upon the bowel, and one is at times forced to conclude that too much has been made out of the dangers of prolonged trial of the taxis, though doubtless the nutrition and circulation of the constricted parts in these instances may have been seriously interfered with.

To apply the taxis the patient should be placed upon his back, with his shoulders raised and the thigh partially flexed and rotated inwards, so as to cause as much relaxation as possible of the tissues in the neighborhood of the neck of the sac.

The surgeon lightly grasps the neck of the sac between his left thumb and forefinger, and when all is steadied, with all the fingers and the thumb of the right hand he seizes the tumor, and attempts, by a combination of a pulling down movement and squeezing, to expel the liquid and gaseous contents of the sac, and secure its return. It is advisable, as just said, to make traction downward at first before an

attempt is commenced at pushing up the tumor. The pressure should be very moderate and even, and accompanied with a slight kneading movement. The degree of force applied (always slight) should be exceedingly gentle in cases where the hernia has been long prolapsed. Where the symptoms are very acute from the moment that the hernia has descended, or where there is evidence that the sac is inflamed or that the gut is gangrenous, the taxis should not be attempted.

After gentle pressure for some time the operator may have the satisfaction of feeling the hernia suddenly slip up with a jerk and gurgle. If he has used no force he may feel confident that all is well, but if considerable pressure was being employed at the moment of the ascent of the tumor he may reasonably fear that the hernia has been returned *en masse*, or that rupture has occurred. Omentum goes up gradually and without noise.

When the taxis fails after a moderate trial, the patient may be put to bed, and before deciding upon herniotomy the effect of cold upon the tumor may be tried. Where the strangulation is very acute, or where the bowel has been prolapsed for days, or where there is evidence of gangrene or inflammation, or where the hernia is known to have been irreducible before the symptoms of strangulation set in, no further delay should be permitted, but herniotomy should be at once resorted to. In recent cases, however, there is a reasonable hope that cold combined with the taxis may succeed where the latter has failed alone.

Ice may be applied to the tumor for three or four hours. Leiter's tubes may be tried, or the intense cold produced by the ether spray apparatus may be utilized. These in recent cases have been known to effect reduction. They are valuable when the symptoms are not urgent and where vomiting is not severe; and in cases of delay in procuring an operator they are of great value if they only succeed in preventing continuous attempts at the taxis. A large dose of opium (2 to 3 grains) or a hypodermic of morphine may be given under such circumstances with advantage.

Hot baths are doubtless of much value where a large bath can be brought alongside the patient's bed, but the usual practice of causing a patient who is suffering from strangulated hernia to walk down one or more flights of stairs to the bath-room is a serious danger.

The taxis with the body inverted, or the intestines inflated by enemata, and various other plans of this kind, should be discountenanced.

The practice of aspirating the contents of recent herniæ and then applying the taxis has found favor with several surgeons, and if a very fine hollow needle be used, there is little danger of extravasation. Thus, Hearn has tapped the tumor with a hypodermic needle in thirty-two cases, with easy reduction in twenty-eight. In the remaining cases, after the tapping, the hernia was operated upon, and no traces of the punctures could be detected. It fulfils all he claims for it—viz., it avoids the delay almost inseparable from herniotomy, it lessens the evils of the taxis by diminishing the tension of the tumor, and it very

often does away with the necessity of the cutting operation, with its septic dangers.

Where the above-mentioned measures fail, the last final trial of the taxis is to be made under the influence of chloroform or ether. Before administering the anæsthetic, it should be finally decided that if the tumor cannot be reduced under a few minutes' trial the surgeon should proceed with the operation of cutting down and relieving the strictured bowel without waiting for the patient to come from under the influence of the drug. Often reduction takes place easily under chloroform where the taxis has previously failed without its aid.

It sometimes becomes a serious question whether the surgeon is justified in operating, owing to the advanced state of collapse in cases where there has been great delay before coming under notice. The death of the patient being obviously inevitable without relief, he should always get the benefit of the doubt, and the operation should be always tried. It is surprising how the most unpromising cases sometimes recover. The writer has operated successfully in a case where a recent hernia had been down seven days.

The operation is not necessarily a very painful one, and where chloroform is not admissible, cocaine injected over the tumor considerably relieves pain.

The writer has assisted Dr. J. W. Browne at a case where the patient, owing to a heart complication, decided to have herniotomy performed without an anæsthetic. She watched some of the stages of the operation with manifest interest, and exhibited little signs of uneasiness, though cocaine was not used.

The hair should be shaved from the surface of the tumor and the skin carefully washed with sublimate or carbolic solution. As the patient lies upon his back with the shoulders raised and the knees flexed, an incision should be made over the neck of the sac. Its extent will depend somewhat upon the size of the tumor. In femoral hernia it may be made in a vertical direction, internal to the crual opening, or in an oblique direction, somewhat parallel to Poupart's ligament. In inguinal hernia the incision may be best made in the direction of the canal.

The tissues are to be carefully divided, each layer being incised separately until the sac is exposed. The free use of the director is an advantage, as the appearance and thickness of the different layers of tissue vary so widely in almost every case. Vessels should be tied as the operation proceeds. After exposure of the sac, the tissues outside its neck, if seen, and felt by the index-finger to be the cause of the stricture, are to be carefully divided upon a hernia director by means of a suitable hernia knife, the surgeon watching the coil of bowel which may bulge in front of his knife, and seeing that it is not injured. A short incision upward is the best, and if easy and satisfactory reduction follows with the characteristic jerk, the sac need not be opened. Where any doubt exists about the thoroughness of the re-

duction or about the state of the bowel, and especially in cases where the gut has been long strangulated, the sac should be opened upon a director by pinching up a fold with the forceps.

In these latter cases it will be better practice to open the sac first without waiting to relieve the stricture, as the parts can then be thoroughly examined *in situ*. If found satisfactory, the strictured neck of the sac may then be divided and the contents returned.

The condition of the bowel is a serious consideration; if found purple or almost black, but free from gangrene, though covered with lymph and ecchymosed, it may be safely returned.

In other words, if alive and unperforated or unruptured, it should be returned. When found to feel like wetted leather and devoid of its natural elasticity, and ashy in color or fetid in smell, the surgeon knows that it is dead. If ruptured or perforated it is equally unfit for return. The best course, then, is to thoroughly define the exact extent of the mischief and resect the destroyed part. Small perforations may be treated by removing an oblong portion of the intestinal walls and suturing deeply and superficially, after which the knuckle or coil of bowel may be returned.

The less handling of the sac contents the better, and the operation should be carried out under antiseptic precautions.

Omentum, unless when gangrenous, should be returned. Sometimes, however, its reduction is impossible, in which case it may be excised, and after ligature of all vessels, the stump may be returned.

On reduction of the hernia, Treves, after closing its abdominal orifice, recommends the excision of the sac. Generally, it will be found convenient to free the neck of the sac, after which a catgut ligature may be employed to thoroughly close the peritoneal cavity, a portion of the ligatured sac below the catgut only being excised. This hastens the healing of the original wound which may be sutured, and a drainage-tube left *in situ*, and a large pad of iodoform gauze, with a firm hernia spica bandage applied.

Ice and opium, minute quantities of liquid nourishment and absolute rest, comprise the chief points in the after-treatment. The bowels should not be allowed to act for ten days, and then only by tepid water and olive oil.

Inflamed hernia: The cause should be remedied, the irritation of a truss often being the factor, in a hernia which is not reducible. The taxis may be the cause, hence any attempt to reduce a hernia, the seat of inflammation, should be avoided. Rest in bed, with the application of cold to the tumor, is generally all that is required. The best method is to apply Leiter's tubes over the hernia or to use an ice bag. Pain should be relieved by opium which is also necessary to secure absolute rest to the bowel. The diet should restricted to beef tea or iced-milk.

The radical cure of hernia has been carried out of late years with wonderful success, Wood having operated without a single death upon

200 consecutive cases of simple reducible hernia in which truss-pressure had failed to effect a cure.

Irreducible herniæ and strangulated hernia, after herniotomy, have been also successfully dealt with in this way. Dr. H. O'Neill has had a series of successful cases in young children.

The rationale of the treatment consists in closing up and obliterating the internal ring and sides of the inguinal canal, with the pillars of the external ring, the neck and sac cavity. This is carried out by means of one silvered wire ligature applied subcutaneously.

The operation is modified in endless ways by different surgeons. Some, like Banks, remove the entire sac. Macewan, after separating it, leaves it as a support for the weakened abdominal walls. Spanton causes closure of the canal by a corkscrew instrument left *in situ* after being inserted over the finger when the tissues are invaginated. Many of the modifications are unnecessary complications.

For the details of the operation and its modifications, the reader is referred to the exhaustive article on the subject by Professor Wood in Heath's *Dictionary of Practical Surgery*, or to Fowler's article in the November number of the *Brooklyn Medical Journal*. 1889.

HERPES.

For the most part, herpes præputialis, herpes labialis, and herpes iris are trivial and short-lived troubles, which require no treatment. Occasionally a mild local sedative may be applied, and, owing to the common site of these eruptions—*viz.*, on the face, lips, or hands—powdery preparations are inconvenient. An ointment like the following answers all cases:

℞.—Calamin. præp. ʒj.
Liq. plumbi subacetat. ʒss.
Unguent. zinci oxid. ℥jss.—M.

The vesicles may be painted over with flexile collodion where an ointment is not convenient.

In some cases of herpes præputialis, with a long foreskin, powders are especially useful.

Herpes zoster, or shingles, is sometimes a very painful affection. Mild cases require little treatment, except local applications, to prevent injury and friction to the vesicles until they spontaneously wither up.

A piece of lint or soft linen, smeared over with the above ointment, laid upon the seat of the eruption and covered with a pad of soft, absorbent wool, fastened with a light bandage, is a simple routine plan, meeting all the requirements in most cases. Where pain is severe, cocaine may be added to the ointment, or cocaine or morphine can be mixed with collodion and painted over the vesicles. Where the situation of the eruption permits, powders are better. The parts may

be well dusted with powdered starch, oxide of zinc, calamine, bismuth, calomel, lycopodium, Fuller's earth, talc, etc.

Acute neuralgic pain may demand anodynes by the mouth or, morphine hypodermically, and should the vesicles burst or get rubbed, the smarting may be relieved by lotions containing lead and opium. Many writers testify to the remarkable power exercised by small and frequent doses of ($\frac{1}{10}$ grain) phosphide of zinc in diminishing pain and cutting short the eruption. With the view of aborting the attack, Unna paints the affected region over with a paste made by rubbing ichthyol with water, or by applying a gelatin paste containing zinc and resorcin. The continuous or interrupted current has been used with the same intention, the electrodes being placed over the course of the affected nerve.

Dupas has reported that the eruption may be caused to abort in a few hours if the following treatment be at once commenced. He soaks absorbent wool in 90 per cent. alcohol, lays it upon the seat of the developing eruption, and covers it with oiled silk. A 2 per cent. alcoholic solution of resorcin, or of tannin, or of menthol, or thymol, acts even more rapidly. Thiol, in 30 per cent. aqueous solution, has also been found very efficacious.

The neuralgia sometimes following the attack may be treated with quinine, salicylates, antipyrine, arsenic, etc. The writer has seen colchicum prove useful, as recommended by Fagge. He has had good results from the continuous current.

Where the eruption appears in the course of the ophthalmic division of the fifth nerve, the severe pain must be relieved by narcotics or antipyrine. Cocaine may be dropped in solution into the eye, and the lids covered with a piece of lint smeared with an ointment of calomel (15 grains to 1 ounce), and the eye bandaged over with a large pad of borated wool. The greatest care must be exercised in preventing the accompanying conjunctivitis and keratitis from causing ulceration and perforation.

HICCOUGH.

The cause, when possible, should be removed, and as this may often be found in the stomach, a smart emetic may stop this troublesome symptom. A teaspoonful of mustard in a tumblerful of warm water is a speedy and efficient agent for producing vomiting.

Sedatives to the gastric surface, as morphine, cocaine, and chloral, may be tried; they often fail. Morphine hypodermically or chloroform inhalation will sometimes remove the hiccough entirely. Nearly always temporary relief can be procured from their use. Doses of narcotics sufficient to affect the respiratory centre may relieve speedily; if not, their administration should be stopped, as they make matters worse.

Cannabis indica, opium, hyoscyamine, camphor, oil of amber, magnesia, musk, vinegar, bromide of potassium, bismuth, antipyrine or

antifebrin, belladonna, ether, nitro-glycerin, hot brandy, nitrite of amyl, iodoform, creasote capsules, turpentine, hydrocyanic acid, strychnine, valerianate of zinc, pilocarpine (hypodermically), ice, and many other remedies have been used successfully. Unfortunately, the use of any remedy is purely empiric. What relieves or cures at one time will often fail utterly upon the next trial. A smart purge should be given when the symptom has continued for any time, and the various drugs in the above list may be tried in turn.

Many methods have been advocated by which the nerve-supply of the diaphragm may be influenced, either directly, reflexly, or by inhibition. Thus a sudden fright stops hiccough in children promptly, but though the writer has often proved this, there are serious objections to the use of this agent as a therapeutic remedy.

A less objectionable method of treating the affection is by directing the patient to take a deep inspiration or expiration, and to hold his breath as long as he possibly can. Raising the arms above the head, and keeping them there until the muscles tire, sometimes stops it. Counter-irritation to the stomach, cervical spines, or over the phrenic nerve may succeed. Pressure over the nerve in the region of the scalenus anticus sometimes stops it instantly. Sneezing may be induced by snuff or ammonia, and may cause the hiccough to cease.

Cold applied to the lobe of the ear or to the external meatus has been found successful, and cocaine may act in a similar way.

Galvanism seldom does any good, but a smart shock sometimes speedily relieves, probably by its moral effect. A cold shower bath may act in the same way. These latter agents are especially valuable in hysterical cases.

HIP-JOINT DISEASE.

The chief indication at the beginning of this serious ailment is to prevent all inter-articular pressure. The patient should be put to bed upon a hard, unyielding hair mattress with his head comfortably raised, but with the shoulders in the same plane as the body. He should lie upon his back, and extension by means of the weight and pulley should be brought to bear upon the affected limb. This is easily done by attaching a loop or stirrup to the ankle and heel by means of plaster, to the stirrup a cord is attached which passes over a pulley, and to its end a weight of two to six pounds is attached. This treatment is to be kept up until all deformity disappears, and until pain and tenderness about the joint are no longer felt. It is the best of all methods of dealing with acute cases, or with those examples of the disease associated with much pain or spasm of the muscles. Where considerable deformity has already occurred without ankylosis, and it is highly desirable that this should not occur in a position which might seriously interfere with the use of the limb, the deformity should be removed before beginning extension.

With this object in view the patient should be chloroformed and

the deformity partially remedied. The utmost caution and gentleness being essential in order to avoid setting up further mischief in the joint, it is wiser not to insist upon the deformity being entirely remedied by manipulation. The extension by pulley and weight will complete what force has already partly accomplished under chloroform.

Unless the deformity be long established or severe, chloroform and manipulation will not be required. The weight and pulley, if skilfully adapted, will reduce most angular positions in a few weeks, and it will be wise to give extension a trial before resorting to what may end in exciting further mischief in the joint.

Marsh lays stress upon the importance of applying the extending force in the direction of the axis of the deformity, otherwise interarticular pressure is not diminished.

Abduction is best corrected by applying the weight and pulley to the affected side as just described. After a few days a long splint may be adjusted to the sound limb. This is, moreover, advisable in all cases, as it prevents the patient moving or sitting up.

Where marked adduction is present the deformity must be corrected. This is done by treating the affected limb with weight and pulley in the ordinary way. The sound limb is then bandaged to a long splint, from the inferior end of which a cord is led along the outside of the splint to a pulley fastened at the top of the bedstead by fixing a weight to the free end of the cord. The extending forces are applied to the different limbs in opposite directions, and adduction is minimized.

As soon as possible the patient should be put into a Thomas's splint with a high-heeled boot on the sound foot, and allowed into the open air upon crutches. If the affection is at a standstill during the winter, bed is the best place for him, and the extension by weight and pulley may be kept up for a long period; but in summer Thomas's splint may be applied at an earlier period. It is of vital importance that time be not lost in these cases when the season admits of the patient getting out. Struma or tubercle is the cause of hip-joint disease in the great majority of cases, and the appropriate treatment for this malady must be carefully carried out simultaneously with mechanical management. The advantages of change of air and scene and a sojourn at a sheltered seaside spot, protected from the north and east, cannot be exaggerated, but the temperature should be equable, and the air as far as possible free from excessive moisture. All means to improve nutrition and raise the standard of health should be attended to, but as these are referred to under Scrofula they need not be here enumerated.

The splint should be worn both day and night as long as there are any symptoms of mischief. Should pain or tenderness supervene, the splint must be removed and the patient placed upon his hard mattress with the pulley and weight, and kept there for a month after the acute symptoms have passed away. As Thomas's splint must be worn for a long period—perhaps two years—steps should be taken to counteract the evil consequences which are bound to follow its constant application.

This can only be done, after local symptoms have disappeared, by the careful and judicious employment of gentle massage applied to the wasted and weakened muscles of the limb.

Notwithstanding the most rigorous application of rest, sometimes the case goes on to suppuration and enormous abscesses may burrow in various directions and set up fatal exhaustion and hectic.

Aspiration in such cases is a serious mistake. A free deep incision to thoroughly evacuate the abscess sac, after which a good sized drainage-tube should be inserted and left till the suppuration process ceases, will be the best practice. Where diseased bone is evident a modified excision operation may be confidently undertaken, and all dead bone removed and every trace of diseased tissue taken under the strictest antiseptic precautions. Barker fills the cavity with iodoform emulsion, and puts the patient at once on a double Thomas's splint.

There is still much difference of opinion regarding the propriety of resorting to the ordinary operation of excision of the hip. The writer, speaking from a limited experience and more from the standpoint of a physician, might summarize the objections in a sentence. In *advanced* cases the results are bad, in early cases they are often satisfactory, but to ensure these satisfactory results the operation, which is always a serious one, must be undertaken at a stage in which there would be still legitimate ground for expecting a *better* result from extension and rest.

The recognition of the tubercular nature of hip-joint disease of late years has led to more persistent advocacy of operative interference, and the various methods of treating local tubercular abscesses is fully described under Tuberculosis. The Dublin method of drilling the bone in the neighborhood of the joint, washing out with carbolic lotion and securing absolute fixation has given excellent results.

Where there is extensive disease of the head and upper end of the shaft of the femur with a similar condition of matters in the pelvic bone, the only course open is amputation. A case must be indeed very far advanced which justifies the surgeon in refusing to amputate. The aspect of the parts which at first sight is so unpromising may be the best reason to hope for a success in apparently hopeless cases. The pale gelatinous and strumous infiltration of all the tissues, riddled with sinuses, may be divided in some cases with surprisingly little hemorrhage and shock to the system. In 1872, the writer, with Dr. Newett, operated in an apparently hopeless case. The femur was found extensively diseased in its upper third, and was the seat of spontaneous fracture, and there was advanced destruction of the ilium, ischium, and acetabulum. After all dead bone had been removed and a considerable portion of the pelvis gouged away, the vessels were discovered to be so diseased as not to bear a ligature, and it was found necessary to dissect up the femoral artery in the flap, and apply a ligature to the external iliac in the abdomen, which the writer accordingly did.

Though the patient had suffered much from night-sweats and haemoptysis, she made an excellent recovery, and is still living and in robust health. If the reader wishes to see the best statement upon the results of treatment of hip-joint disease without excision, he should consult Professor Marsh's valuable paper in the *Lancet* of July, 1889, in which he shows that though the early operation is followed by rapid healing, the limb is weak and defective in usefulness when contrasted with the serviceable member the result of rest and extension

HIVES—See Erythema.

HOARSENESS.

The removal of the cause should be the first object, simple over-straining of the voice being a common cause of this condition, rest should, as far as possible, be insisted upon. The use of the following gargle relieves, and when some effort of the voice is inevitable, either in singers or public speakers, it may tide them over an engagement:

℞.—Acidi tannici ʒj.
Pulv. sodii bor. ʒj.
Tinct. capsici ʒss.
Aquæ rosæ ℥x.—M.

Make a gargle.
S.—To be used frequently.

Where hoarseness results from or is symptomatic of a true inflammation of the larynx, the remedies suitable in laryngitis are to be used. Local laryngeal troubles, as small tumors or thickening of the cords, interfering with the closure of the rima may be dealt with surgically. Syphilitic affection will probably disappear under mercurials. Exudation, as in diphtheria, may only betray itself in hoarseness, and demands treatment of a prompt and serious character. (See Diphtheria.) Hoarseness, depending upon centric nerve lesions or the pressure of aneurismal growths causing partial paralysis of the adductors of one cord, will demand attention to the primary lesion.

(See also under the heading of Laryngitis for the treatment of the various conditions of which hoarseness is the chief symptom. See also under Throat.)

HOSPITAL GANGRENE—See Gangrene, p. 272.

HYDATIDS.

In the consideration of the treatment of this serious malady, the question of prevention should hold the first place. The disease is the direct result of the introduction into the human alimentary canal of the eggs of the *tænia echinococcus*—a small tapeworm infesting the dog and wolf. The human hydatid is the larval form of this parasite.

The eggs find their way into the human stomach chiefly through drinking-water. Hence the necessity, in districts where the parasite abounds, to look more closely to the filtration of water and the purity of food. The utmost scrupulosity should be observed as regards the personal cleanliness of all who come into close relations with dogs. This minute worm is often found in dogs in this country in vast numbers in the small intestines. As the mature worm does not exceed one-sixth of an inch, it is easily seen how readily the invisible eggs or the last small joint of the worm which alone contains the developed sexual organs, may find entrance into the human stomach in water or on salads, etc.

Curative treatment must be surgical. The wild statement made about the efficacy of kamala, turpentine, iodides, chloride of sodium, etc., have been proved to be devoid of truth. No drug at present known can be expected to destroy the hydatid when given by the mouth.

About surgical procedures there is much diversity of opinion. Electrolysis has had its advocates, and Fagge and Durham have reported ten consecutive successes after passing two fine gilt needles into the cyst at different places. The positive pole of a ten-cell battery was connected with a sponge electrode placed over the tumor, while the needles were attached to the negative pole; ten minutes sufficed for the passage of the current. Fagge attributed the success of the operation to the punctures made by the needles, permitting some of the fluid to escape out of the cyst into the abdominal cavity. He tried simple acupuncture, and found it did equally well. Suppuration never occurred.

One fact has been abundantly proved, that if a minute quantity of the liquid contents of the cyst be drawn off with a fine syphon-trochar, the result may be the death of the parasite and the gradual shrinking or withering up of the tumor. This is by far the best treatment for cysts situated in solid organs like the liver. Aspirating these cysts, when embedded in any solid region, is apt to cause such traction upon their walls by suction as may lead to inflammation and suppuration. If the aspirator be used, all the contents should not be removed. Where a small cyst depends from the liver into the abdominal cavity, the removal of a portion or of the whole of the fluid contents by a long, very fine aspirator needle attached to Dieulafoy's instrument is the best practice. The operator should be slow to repeat the tapping in case the cyst should soon fill again, until a sufficient time has elapsed to show whether the hydatid still lives. In such cases it is very undesirable to run any risk of suppuration, and time may prove that the operation has fulfilled its object, and further waiting may show the gradual withering of the tumor.

Where a movable cyst of moderate or large size hangs very freely into the abdomen, it is considered safer practice to establish adhesions between the walls of the abdomen and cyst before tapping. This can be done in any of the ways in which ovarian cysts were formerly

treated. Should the hydatid, however, be freely movable, the method of inserting a number of hare-lip pins through the abdominal wall into the cyst, and leaving them there for twelve hours, may be employed. After the withdrawal of the pins, the cyst, if a small one, may be tapped with a fine needle, and if of large dimensions a wide trochar may be plunged into it, and the cavity washed out daily with antiseptic solutions to get rid of the daughter-cysts in its interior.

Fitzgerald has successfully removed very large hydatids by performing abdominal section, and in this direction surgical progress is rapidly marching.

Morris, after removing the fluid contents, incises the cyst-walls and stitches their divided edges to the edges of the incision in the abdominal parieties, without taking any means for insuring previous adhesion between the cyst-wall and abdominal wall before operating.

Gardner, of Australasia, has successfully operated very frequently for hydatids, and he states that he has no hesitation in resecting ribs, opening the pleural cavity, incising the diaphragm, stitching the cyst to the diaphragm, and the diaphragm to the costal pleura and skin in all cases in which he finds cysts situated on the convex surface of the liver, a drainage-tube being always inserted into the lowest part of the pleural cavity to provide drainage of any subsequent empyema.

Where suppuration has already occurred. the hydatid cyst may be treated as an ordinary abscess, and dealt with by free incision, by washing out with antiseptics, and by establishing drainage.

The injection of various substances into the cyst, in ordinary cases, with the view of causing the death of the hydatid has been advocated, and is still sometimes practised, but it is unnecessary, and liable to be followed by profuse suppuration. When the cyst is adherent and a large opening made, iodine and other antiseptics may be employed to destroy smaller internal cysts too large to come through the opening, which should be kept patent by the insertion of a large India-rubber tube.

Ox-gall, extract of male fern, and other anthelmintics should be abandoned, their injection into the tumor being certain to cause suppuration, which the surgeon is anxious to avoid.

Hydatids in the lung or pleura can be successfully treated in any of the ways described, the introduction of a long fine needle or trochar attached to the aspirator being the best. The guiding principle is that obtained by experience—that if even a small quantity of the fluid is withdrawn, the cyst may wither up without suppuration. Should suppuration occur in the pleural cavity, a free incision must be made between the ribs, and the space washed out and drained as in empyema. Abscess of the lung, if near the surface at the base, may in some cases be successfully treated in a similar way. Aspiration and subsequent injection of carbolic or weak bichloride solution have given good results. Gardner has performed thoracic section in nineteen cases of lung hy-

datid, with only two deaths, and abdominal section in forty-seven liver cases, with five deaths.

Trephining for brain hydatids has been successfully performed.

HYDROCELE.

Chronic hydrocele of the tunica vaginalis is a very common affection, and one very frequently presented to the surgeon for treatment. If the collection of fluid is small and has remained stationary for any considerable period, it may be well to let it alone. When it has already reached dimensions entailing inconvenience or pain, it should be tapped. This is done with a moderately fine, sharp trocar and canula. The writer uses the largest-sized instrument, generally supplied with the aspirator. Having placed the patient standing with his back against the wall of the room, the surgeon ascertains the exact position of the testicle in the tumor, after which he grasps the neck of the scrotum firmly between the thumb and fingers of the left hand and applies pressure, so as to render the hydrocele very tense. The oiled trocar and canula should be held firmly in the right hand, with the tip of the index-finger about two-thirds of an inch from its extremity, and plunged into the sac, avoiding the testicle. As the trocar is withdrawn, the canula is thrust *home* in the direction of the cord by depressing the hand. After the sac of the tunica vaginalis is thoroughly drained, the minute opening closes almost completely; if not, a strip of plaster applied over a bit of lint or gauze is all that is needed. Hospital patients generally immediately afterward resume work, though this is to be forbidden. In their case it is better to tap the tumor after their day's work is over. In a small percentage of cases the hydrocele does not again form, but generally the fluid reaccumulates at a shorter interval after each tapping.

Many persons prefer to be relieved in this way when the fluid continues to accumulate slowly, but, especially in young subjects, the surgeon should recommend a radical operation. This is carried out after tapping, by injecting through the canula into the sac, with a syringe possessing a long nozzle, one drachm of tincture of iodine and one drachm of alcohol. After its injection, the scrotum may be kneaded between the finger and thumb, with the view of setting up further irritation by the manipulation.

Different operators have their favorite injections; some even prefer to draw off the injection through the canula before withdrawing it. The tincture of iodine may be diluted with a larger quantity of alcohol. A good solution is the following (the whole may be injected):

R.—Iodi purif.	gr. x.
Potassii iodidi	gr. viij.
Aquæ destil.	℥iv.—M.

Care should be exercised in the injecting or drawing off of the liquid

(when this is done) to prevent the escape of any into the cellular tissue outside the sac.

Tincture of iron, port wine, chloride of zinc, bichloride of mercury solution, or a few grains of red precipitate or iodoform, and many other irritasing substances, are used, but the above answer most purposes. It is necessary that every drop of the hydrocele fluid should be first evacuated and that the manipulation should afterward insure that the injection be made to come into contact with every part of the sac. The patient should be sent to bed for a day or two, as sometimes the inflammation excited by the irritant sets up considerable local pain and uneasiness, though in some successful cases neither pain nor uneasiness may be experienced throughout.

Excellent results have been recently obtained by injecting from 5 to 10 grains of pure carbolic acid, and some surgeons permit the patient to immediately resume his work after the injection. It causes little pain.

In one case in which the writer used the carbolic acid injection the sac became suddenly tympanitic, but there was no other untoward result, and the cure was complete, without pain or distress of any kind. It was not possible to see how air had been admitted. The hydrocele was an old one, and had frequently been tapped before.

If a weak solution of cocaine be injected before the irritant, a practically painless operation may be performed after its removal.

In some cases failure results; the fluid which is secreted after the injection does not become absorbed, and the case returns to its old condition. A second or third trial may be made by injections, each time using a stronger solution, and if these fail, the following means should be employed.

Incision of the tunica vaginalis is made for about two inches by cutting with a sharp scalpel vertically into the front of the tumor. After tying all vessels and washing out the cavity with antiseptics, a drainage-tube is to be left in and the edges of the incised tunica are to be sutured to the margins of the skin wound, and the scrotum dressed antiseptically.

Partial or complete resection of the tunica vaginalis may be required in very obstinate cases, so as to prevent two serous surfaces coming in contact. Southam successfully removes the whole of the parietal layer.

Hydrocele in infants or young children may be treated by acupuncture when iodine applications or cooling or astringent lotions fail to cause absorption of the fluid in the closed sac of the tunica vaginalis.

A glover's needle or hare-lip pin is thrust into the sac through the skin over the hydrocele, and without withdrawing it through the skin wound it is several times withdrawn from the sac and pushed in again in different places. In this way the fluid from the hydrocele passes into the cellular tissue of the scrotum and is absorbed, and the case

often ends in a radical cure. Where this measure fails, tapping and injections must be resorted to.

Acupuncture may be used with success in those cases where the hydrocele in infants extends for a variable degree along the front of the cord without any communication with the interior of the peritoneal cavity. It should always be resorted to before injecting with iodine or carbolic acid.

Congenital hydrocele requires different management from the varieties just mentioned. In it there is an uninterrupted water-way between the cavity of the peritoneum and the tunica vaginalis. Here the first object should be to prevent the descent of a hernia through the patent canal, and at the same time to take steps to hasten the closure of the congenital opening. Both these objects are attained by gradually forcing all the fluid back into the peritoneal cavity, and applying an accurately fitting truss to be worn day and night until sealing up of the opening is effected. Afterward any accumulation of fluid still in the tunica may be treated by acupuncture or injection. Where these means fail, especially if hernia co-exists, a radical operation for the closure of the neck of the sac may be undertaken.

Encysted hydrocele of the cord or testicle, when of such dimensions as to cause inconvenience or pain, may be treated exactly as if an ordinary chronic hydrocele of the tunica vaginalis. It may be tapped, and should the fluid continue to re-accumulate after successive tappings, iodine, carbolic acid, or other irritating liquid may be injected, and should failure still follow, an incision may be made and the cavity drained and dressed antiseptically.

HYDROCEPHALUS, Acute—See Meningitis.

HYDROCEPHALUS, Chronic.

The treatment of this malady can only be palliative. Everything should be tried which can be expected to improve the faulty nutrition upon which the diseased condition is probably depending. In those cases where the accumulation of fluid is believed to be caused by the pressure of scrofulous tumors, the various means by which the strumous condition can be improved may be employed with some hope. (See Scrofula.)

Where the condition supervenes upon the acute affection, or where it is supposed to be owing to an idiopathic dropsy, counter-irritation of the scalp by iodine or cantharides, has been recommended, but little is, however, to be expected from this treatment. In very young subjects the careful inunction of mercurial ointment has given some decidedly satisfactory results. It cannot, however, be pushed far without doing harm. Iodides internally, in combination with bromides, afford the best chance of improvement. The writer believes that there is no means by which the nutrition of the body can be so rapidly improved as by the inunction of cod-liver oil in the way described under the

heading of Mesenteric Glands. It should always have a chance in such cases as these under consideration. It may be rubbed into the scalp, and cloths saturated with the oil may be worn under a water-proof cap. Strapping of the head to prevent increase in size appears to be dangerous practice, though sometimes good results have followed the pressure of an elastic bandage worn for a considerable time over the scalp. Puncture of the cranial bones, or of the space between the expanded sutures, can only be thought of as a last resource to purchase temporary relief in the final stages of the affection. Purgatives, diuretics, or forced abstinence from liquids with a view to diminish the vascular tension, and thus reduce the accumulated dropsy in the ventricles, afford no prospect of success.

Iodine solutions have been heroically injected into the ventricles without producing evident good or evil. Perhaps the best results may be expected from an elastic woven bandage applied over cod-liver oil applications, with iodides or weak mercurials internally in young subjects.

HYDRONEPHROSIS.

Where the cause can be traced to the blocking up of the ureter by a calculus, the first duty of the physician should be to immediately set about putting the patient in the most favorable condition to prevent the formation of another calculus in the sound kidney. (See under Stone in the Kidney.)

Where the tumor is not already very tense and of long duration, the simple operation of manipulating it through the abdominal walls should have a fair trial. With the anatomical position of the kidney and ureter, and their relations to other organs in the abdomen before the physician's mind, he may try a series of massage and pressure movements with the view of dislodging the calculus, or causing the fluid to flow past it into the bladder. This succeeded in one case in the hands of Sir W. Roberts, and the writer once believed that he caused a partial reduction in the size of the hydronephrosis after a prolonged examination, during which the tumor was submitted to a good deal of manipulation. This manœuvre is worthy of a trial, and before commencing it the patient's abdomen should be freely poulticed or swathed in warm water bandages covered by a piece of stout mackintosh for forty eight hours—a local hot pack. It is needless to say that undue force should not be employed. Aspiration or tapping must be resorted to when the tumor is tense and of large dimensions. The site of the puncture is of importance. The sac should be entered from behind, midway between the last rib and the iliac crest, two and a half inches behind the anterior superior spinous process on the right side. On the left side the best spot is one just in front of the interval between the last two floating ribs (Roberts). All the fluid should be removed through a moderately fine and long needle. Three results are within the reach of possibility: (1) The fluid may not again accumulate

owing to the previous destruction of the entire secreting structure of the kidney; (2) the tapping may, by relieving or removing the pressure and irritation, cause the descent of an impacted calculus into the bladder; or (3) it may be followed by a discharge of the hydronephrotic fluid into the bladder without the descent of any obstruction. These results, though very improbable, have been recorded in isolated instances, and justify the operation of tapping before resorting to more severe and dangerous measures. Aspiration may be repeated as often as the urgency of the symptoms demand, and in most instances is the only available means of relieving the distress and prolonging the life of the patient.

Of other measures the operation of establishing a free drainage of the sac, or of establishing a permanent fistula, has been followed by good results.

This is accomplished by first performing the operation of nephrotomy by making a free incision into the pelvis of the kidney through a wound in the lumbar region.

To cut down upon the ureter and remove the impacted calculus where fortunate signs or symptoms localize its exact situation, is not beyond practical surgery. The use of the endoscope may turn out invaluable in some cases.

Nephrectomy affords in some cases the only hope of a permanent cure. By a lumbar incision (near the outer border of the erector spinæ) the kidney and dilated sac may be removed without opening the cavity of the abdomen or reaching the peritoneum.

Some of Morris's reports show that the kidney in these cases with the dilated sac can be as easily extracted as an ovarian cyst which has but few and recent adhesions. He ligatures the pedicle by surrounding the renal artery first, and afterward the renal vein and ureter by kangaroo tendon ligatures.

A case of hydronephrosis has been recently reported where rest in bed, with elevation of the pelvis by pillows, was followed by the evacuation of the contents of the tumor through the urethra.

Landau has published a series of cases where the hydronephrosis was intermittent owing to the occlusion of the ureter by torsion, or tension in patients with moveable kidney. In these cases, position with manipulation or external pressure for the most part succeeded in hastening the evacuation of the retained secretion, though some of his cases resisted these measures and ended in suppuration.

Goodhart has recently published two typical cases of hydronephrosis which had spontaneously recovered, and he reasons that many patients would recover if let alone.

HYDROPHOBIA.

The treatment of this terrible malady has within the past few years excited a deeper interest than any event in the interest of therapeutics, if we except the excitement produced by Koch's statements about

tuberculosis. The short space at his disposal prevents the writer entering into the history of the brilliant steps which have gradually led up to the inevitable discovery of Pasteur. Before entering upon a description of the methods by which the disease is treated by inoculation, something may be said of the means by which it may be hoped to prevent or exterminate the malady.

Rabies is never spontaneous. Always arising from the introduction of a virus communicated to man by the bites generally of rabid dogs, the spread of the disease may be prevented by measures tending to check its transmission among the members of the canine tribe.

A universal muzzling law is expected to do much in this direction. A universal knowledge of the earliest symptoms of canine rabies will do more. Universal protective inoculation of dogs will achieve everything. A bite or wound inflicted upon man by a rabid animal should receive the promptest treatment. A temporary ligature when possible should be applied to the limb above the bite, and the most thorough cleansing of the wound effected. Doubtless many lives have been saved by sucking the injured spot with the lips immediately after the wound has been inflicted. This procedure cannot be said to be absolutely free from danger, though the risk may be regarded as infinitesimal.

After application of the lips, the mouth should be carefully washed out and a free expectoration encouraged. The lacerated tissues should then be subjected to free and deep cauterization, nitrate of silver[1] being the most convenient—in its absence the actual cautery should be used without delay. Strong carbolic acid is equally potent and much less painful. The bitten or lacerated tissues may be excised with the knife, and when this can be done immediately, it will be the most powerful of all measures in preventing after consequences.

Probably of all wounds thus *promptly* treated a very small percentage would be followed by rabies (*possibly* not 5 per cent.). This treatment, however, to be useful must be carried out without a moment's delay. As a matter of fact more or less delay almost invariably occurs, and sometimes no attention is paid to the wound owing to the virulence of the animal not being suspected at the time. In any case, even prompt cauterization of the wound should not interfere with the adoption of further measures, nor should the thought of future inoculative treatment prevent cauterization at the time. Local treatment of the wound, judiciously carried out, must always minimize the danger.

The wound being inflicted, and the animal being reasonably suspected or known to be rabid, or proved afterward to be rabid, the important question comes up: Should the patient take his chance of escaping the after consequences? The answer must in all cases be in the negative.

[1] The writer has been recently informed by Dr. Roux that he regards the nitrate of silver as one of the least reliable of all caustics for the treatment of rabid dog bites.

This is obvious when the risks are considered. According to Ruffer, at least one person in every seven persons bitten by animals believed to be rabid perish from rabies if not treated by the Pasteurian methods. Of bites upon the face three at least out of five die, and wolf bites upon the face are still more fatal. Many authorities give much greater mortalities.

After Pasteur's treatment of *all* cases bitten by animals certified or *proved* to be rabid, excluding those dying during treatment and those dying within fourteen days after treatment had been concluded, the mortality is a little over ½ per cent.

In the year 1888, according to Ruffer, *all* the cases inoculated at the Pasteur Institute numbered 1626. Of these 1.16 per cent. died. Excluding those dying during treatment, the mortality was 0.79 per cent., and excluding those dying within fourteen days after the completion of treatment the mortality was only 0.55 per cent. An examination of the face and head bites shows a mortality of about 2.5 as against about 80 per cent. in the untreated.

In the very recent paper of Dr. Roux, read at the Congress of Hygiene, he gives some interesting figures, which show the result of the Pasteur treatment from January 1, 1886, to January 1, 1891. These figures will include those just given, but as they also include the previous years before the treatment was perfected, the gross results are not so favorable in some respects as those obtained in any single late year.

Of 9465 patients treated during the five years mentioned, the total mortality was 90, or 0.95 per cent. Excluding all the patients dying during the days immediately after the treatment before the preventive inoculation could have had any effect, the mortality amounted to 0.61 per cent. He points out the interesting fact that the mortality was considerably higher among the foreigners treated at the Institute, as these had to travel greater distances, and hence could not get the treatment so soon after being bitten, as those living nearer to Paris.

The total statistics regarding head bites for the five years just mentioned show an increase over those of 1888, but the result is most striking, and affords, perhaps, the most brilliant feature in this marvellous triumph of therapeutic enterprise.

Roux puts down the total mortality of all untreated head bites at 80 per cent.; other authorities place it at a higher figure. 710 patients bitten upon the head and face by animals proved experimentally to have been rabid, or by animals certified by veterinary surgeons to have been rabid, were treated during the five years at the Pasteur Institute, and the result was a mortality of 3.38; only 24 died.

According to the accepted mortality of untreated head and face bites, at least 568 of these would have perished in the absence of the Pasteurian method. This shows a saving of live amounting in this one group of cases to 544.

Again looking at Roux's statistics, the reader will see that if he

accepts the low estimate that of untreated patients bitten by animals *believed* to have been rabid, only one in every seven dies, it will, therefore, be clear that of the 9465 treated at the Institute, at least 1352 would have perished in the absence of the Pasteurian plan. As only 90 succumbed, this shows a clear gain of 1262 lives saved in the five years.

But this is not all. Similar institutes exist in Russia, Italy, Turkey, Brazil, United States of America, and elsewhere, and the benefits conferred upon mankind by Pasteur cannot be overstated.

The virus producing rabies is believed to contain a living organism which has not yet been isolated or cultivated. Bacteria during their life produce chemical substances which ultimately check or inhibit their action, as man secretes substances which if again finding their way in quantity into his organism would cause his death. Pasteur believes that this suicidal weakness of all bacteria affords the means by which their ravages may be checked. His theory is that by injecting the chemical substance into the system of any animal it may be protected from the bacteria which produces this substance. He also attaches considerable importance to the action of the attenuated living virus, which is injected along with the chemical substance.

Recently Hankin has isolated a pure albumose from anthrax cultures by ordinary chemical methods. By injecting this chemical substance, devoid of all living organisms, he has proved that he can protect an animal from the fatal consequences which would otherwise certainly follow the inoculation of the anthrax virus.

Pasteur has not yet been able to isolate the chemical substance which is secreted by the living germs of rabies, but by attenuating the virus he has diminished the amount of the living organisms, and at the same time increased the amount of the protecting chemical substance. His first injections may be regarded, therefore, from a therapeutic point of view, as inoculations of this vaccinating or protecting chemical substance.

It is quite possible that in the future, rabies may be scientifically treated or prevented by inoculations of some chemically pure albumose, which possibly may be synthetically prepared from harmless substances.

Roux has, however, quite recently laid stress upon the far greater protective influence of the inoculations of attenuated virus than of inoculation of the pure chemical substances secreted by the bacteria.

To prevent the manifestations of a bacterial disease, it would appear that the vaccinating substance should be introduced into the system before the inoculation of the living virus. Owing to the fortunate circumstance that the incubation of rabies in man is so tedious, there is left ample time for the rapid action of the vaccinating substance before the outbreak of the disease.

The first step in Pasteur's method is to obtain a definite, strong virus which will always produce death in a given fixed time when injected into an animal. This powerful virus is only obtained after many

inoculations, and when procured, its lethal action is singularly uniform. It is developed in the following manner: A rabbit is inoculated under the dura mater with the virus from a rabid dog, and an emulsion from the medulla of the victimized rabbit is injected into another rabbit, whose medulla is in turn used for the inoculation of a third, and so on. After each inoculation the resulting virus becomes stronger, and the incubation period shorter, until, as the virus gains in virulence, the period of incubation becomes fixed at six days.

The virus of the dog must be made to pass through eighty rabbits before this uniform or fixed virus is obtained. It is then many times more powerful than the ordinary virus of a rabid dog.

A rabbit being inoculated with this fixed virus, takes ill upon the sixth day, and dies upon the tenth day after inoculation. If the spinal cord of this animal is now removed and exposed in a sterilized jar or bottle to air deprived of moisture by the presence of caustic potash, and kept at a temperature of 77° F., it is found that every day produces a diminution in the power of its contained virus. An emulsion, made by rubbing up a portion of the cord before drying, causes rabies to appear in an inoculated animal in six days, and death supervenes in ten days, as just stated. After drying the cord for eight days, and inoculating with it, the animal so treated does not die until about the twenty-fifth day. After drying the cord for fourteen days, no effects whatever follow its inoculation.

Pasteur's method of treating patients bitten upon the limbs or trunk by rabid animals is, as soon as they present themselves upon the first day, to inject an emulsion of the spinal cord, which has been dried for fourteen days, and also an emulsion of a cord dried for thirteen days. The emulsion is prepared by crushing about ½ a cubic centimetre (equal to the volume of about 7½ minims of water) of the rabbit's cord in about 30 minims of sterilized beef-tea, and the injection is made under the skin of the abdomen.

Probably no living organism is contained in these injections, or in those administered upon the second day, only vaccinating substance being found in them, in the opinion of Ruffer. The second day two injections are also made, one from a cord of twelve, and another of eleven days' drying.

Third day	Injections from cords dried during 10 and 9 days.
Fourth day	" " " " " 8 and 7 "
Fifth day	Two injections from a cord dried during 6 "
Sixth day	One injection " " " " 5 "
Seventh day	" " " " " " 5 "
Eighth day	" " " " " " 4 "
Ninth day	" " " " " " 3 "
Tenth day	" " " " " " 5 "
Eleventh day	" " " " " " 5 "
Twelfth day	" " " " " " 4 "
Thirteenth day	" " " " " " 4 "
Fourteenth day	" " " " " " 3 "
Fifteenth day	" " " " " " 3 "

Where the bites have occurred upon the face, or where the bites have been inflicted by wolves, the above simple method has not been found to act with sufficient rapidity, as the incubation in face bites is very much shorter than in ordinary cases.

For these cases the *intensive* method is employed, and the following figures from Ruffer show how this is carried out:

First day	Injections from cords dried for 14, 13, 12, and 11 days.	
Second day	" " " " 10, 9, 8, and 7	"
Third day	Two injections from a cord dried for	6 "
Fourth day	One injection " " "	5 "
Fifth day	" " " " "	5 "
Sixth day	" " " " "	4 "
Seventh day	" " " " "	3 "
Eighth day	" " " " "	4 "
Ninth day	" " " " "	3 "
Tenth day	" " " " "	5 "
Eleventh day	" " " " "	5 "
Twelfth day	" " " " "	4 "
Thirteenth day	" " " " "	4 "
Fourteenth day	" " " " "	3 "
Fifteenth day	" " " " "	3 "
Sixteenth and seventeenth days—No injections.		
Eighteenth day	One injection from a cord dried	5 "
Nineteenth day	" " " " "	4 "
Twentieth day	" " " " "	3 "

It may be said that suppuration never occurs at the seat of injection. This is owing to the scrupulous care which the writer has personally witnessed in every department of the work done at the Pasteur Institute.

Where the symptoms of rabies appear in a patient previously bitten by a rabid animal, treatment should be directed to the relief of the distressing symptoms. There are a few cases on record where the patient has been reported as cured, but most authorities regard these cases as very doubtful. The result may be looked upon as fatal once unmistakeable symptoms of the disease show themselves. Nevertheless, there are some agents which should obtain a fair trial. The writer's experience is limited to two cases, which, it is needless to say, resisted all the remedies available.

The patient may be placed in bed in a very quiet and darkened room, and as few people as possible should be permitted to congregate about his bedside. Hypodermic injections of morphine, or opium and chloral by the bowel, afford some measure of relief to the suffering when chloroform or ether inhalations cannot be tolerated.

Rapid mercurialization by rubbing in the U. S. P. ointment, or by the mercurial vapor bath, has been tried, and was at one time considered as capable of destroying or eliminating the poison.

Every known narcotic has been unsuccessfully tried to prevent the spasms or convulsions. Nitrite of amyl, nitro-glycerin, Calabar

bean, aconite, belladonna, stramonium, Indian hemp, cold affusions, ice to the spine, monobromide of camphor, arsenic, bromides, antipyrine, cantharides, etc., have signally failed. Inhalation of oxygen has been said to have been once successful. The best results may be hoped from curare; if by its use the patient's life may be prolonged, there may be a faint hope that nutrient enemata, mild restraint, and perfect tranquillity may keep him alive till the poison is eliminated. Curare should be given in large doses; $\frac{1}{12}$ to $\frac{1}{4}$ grain may be injected every twenty minutes until there are evident signs of general loss of muscular power.

Lucas Benham has recently published a series of cases of hydrophobia cured by large blood-lettings.

Tracheotomy may possibly be indicated in threatening death from laryngeal spasm.

HYDROTHORAX.

If this term be used to embrace the effusions of fibrino-serous liquid found in inflammatory conditions of the lining membrane of the chest, the reader will find their treatment mentioned under pleurisy. If, however, by the term hydrothorax are meant those cases where the pleural cavity (generally both sides) contains more or less passive dropsical liquid, the treatment will be found under Bright's disease.

HYPERIDROSIS—See Perspiration, Excessive.

HYPERMETROPIA.

As the blurring of vision in this condition arises from an error of refraction—the focus of entering parallel rays falling posterior to the retina—the condition in ordinary cases is easily remedied by suitable convex glasses, which neutralize the hypermetropia. Where the hypermetropia is severe it is best to correct it fully, especially in children, with glasses which should be worn constantly. If strabismus is present, such glasses will remedy this complication, provided it be not constant. When the squint is constant an operation will be required. In the case of older subjects, convex glasses of different strengths are required for near and distant vision.

HYPOCHONDRIASIS.

The treatment of this affection is most troublesome, and often most unsatisfactory. The physician having satisfied himself by thorough and painstaking examinations that there is no organic disease present, finds himself placed in a difficulty. If he obeys his instinct and proceeds to impress upon his patient the view that his symptoms are purely imaginary, and if he makes light of his sufferings or painful sensations, he only aggravates matters by causing him still further to concentrate all his faculties upon his abnormal feelings. Upon the

other hand, the physician may feel that to encourage the patient's consultations and to continue to accept his fees is to compromise his own sense of rectitude. It is perhaps for this latter reason that hypochondriacs are continually driven from one physician to another, much to their injury.

Though the treatment of these patients is most disagreeable, it is the duty of the humane physician to strive and relieve their distress as much as it is clearly his duty to minister to the sufferings of the lunatic or of the victim of hysteria, The disease is a true neurosis, differing by clearly-defined lines from melancholia upon the one hand and hysteria upon the other.

Every department from the highest standard of health must be carefully investigated. Dyspepsia, anæmia, constipation, gout, and other conditions when present are to be met by appropriate remedies.

Open-air exercise, especially if *carried out in the company of others*, boating, bathing, fishing, golf, or any active amusement in which the patient's mind is lifted off his everlasting sensations will do more than physic. Travel, if the patient's means permit of it; if not, when possible, a complete change of employment may be advised. Resorting to hydropathics or places where invalids congregate often does harm. Occasionally, however, the patient returns somewhat improved, but with new combinations of sensations derived from comparing notes with his suffering brethren who flock about most health resorts. As a rule, anything which ensures a complete change of habits and of thought is likely to be followed by benefit. By taking and showing a real interest in the sifting out of his symptoms, the physician should try and gain the confidence of the hypochondriac, after which his calm, firm assurance of the absence of any serious disease sometimes does much to dispel the patient's malady if in the early stages. Now and then one meets with instances of superior intellectual power among the victims of this disorder, and the writer has had successful results by taking such patients entirely into his confidence and explaining to them the nature of the neurosis from which they suffer.

The worst cases, and those which tax the physician most severely, are those occurring in patients who exhibit a strain of insanity in their family histories, such can only be influenced by the tact, judgment, and devotion of their immediate friends. Any attempt to dispel the patient's fancies by directly reasoning him out of them generally ends in the physician losing his influence for good over the sufferer. This must be accomplished indirectly through his friends.

Should drugs be prescribed in cases of confirmed hypochondriasis? Though the answer is a difficult one, the writer does not hesitate to say that they should never be prescribed for the sake of humoring the patient in his whims. There are few patients, who have long suffered from the disease, who do not show some clear indication for constitutional or local treatment. When this can be conscientiously carried out by the physician, it may increase his power over the patient for

good and prevent his falling into the hands of quacks and unscrupulous persons. Medicine should not be prescribed for the hypochondriac as a specific for his ailment in any case, it should always be considered as secondary in importance to the moral treatment. Of the host of drugs recommended, the writer has only seen decided benefit follow arsenic, when given in small doses for lengthened periods, the following is a simple formula:

℞.—Liq. potas. arsen. ℥ xl.
Tinct. ferri chlor. ʒ ij.
Tinct. sumbul ʒ ij.
Aquæ camphoræ ad ℥ iv.—M.

S.—Take a teaspoonful three times a day, after meals, in a wineglassful of water.

Strychnine often aggravates, and there is a concensus of opinion that alcoholic stimulants and opiates or cocaine should be strictly avoided. Relief may be obtained for short intervals by large doses of valerian, and by small doses of antipyrine. One asafœtida pill, given at bedtime every night, can do no harm. The constant current or static electricity may be tried with benefit in some cases.

Where the hypochondriasis shows itself chiefly as an abnormal exaggeration of the symptoms or sensation of some trivial local disease, judicious and successful local treatment should be persevered with in addition to moral treatment.

HYPOSPADIAS.

The treatment of this malformation requires varied, and sometimes extensive plastic operations, the description of which is outside the scope of the present volume. The reader is referred to the article by Professor Wood in Heath's *Dictionary of Surgery*. Minor degrees of the deformity may be left uncorrected since they may cause little inconvenience. The writer exhibited, some years ago, a specimen of artificial hypospadias, which he found in an aboriginal of the interior of Australia. He ascertained from an explorer that at least one tribe in the centre of that continent performs the serious operation of slitting the male urethra open from the glans backward, through the perineum toward the bladder, evidently with the view of preventing procreation. A careful examination of the specimen proves to what extent the most serious plastic operations may be carried out when recovery follows a barbarous mutilation, undertaken without anatomical knowledge, and performed with the crudest of instruments, and without the slightest conception of the necessity of antiseptic precautions.

HYSTERIA.

Upon the first indications of the presence of hysterical tendencies, the general health of the patient should be carefully looked into. Her

diet should be liberal, and administered with frequency and regularity. Active open-air exercise should be insisted upon, even to the extent of producing some fatigue. Regular hours for rest are essential. Everything which over stimulates the cerebral centres is to be avoided, as is also every excitement of the emotions or passions. Healthy and constant mental occupation should be advised, with avoidance of the evils attendant upon social dissipations, with their late hours and unnatural excitements. Sound, wholesome literature, instead of the maudlin, sentimental trash of cheap novels, should be supplied as food for the mind, care being taken that the patient be not permitted to tax the memory or perceptive faculties too severely. Sea-bathing or the morning cold bath, when admissible, are valuable adjuncts, and the patient should be strongly advised to retire early to bed, and to persist in early rising.

Any departure from the healthy standard in digestion or assimilation requires to be remedied. Anæmia calls for iron, and menstrual disorders and constipation demand appropriate treatment.

Where the symptoms have become established, preventive treatment is, of course, out of the question, but the above general measures may be applied with benefit in any stage of the affection.

Moral treatment is of first importance in every case, and if the mental constitution of her immediate friends and relatives does not permit of their treating her with *firmness*, her removal to less sympathetic and more reliable companions, or strangers, is advisable. In very confirmed cases, as will be presently mentioned, rigid isolation must be insisted upon. The physician should take her relatives into his confidence, and make it clear, beyond the possibility of being misunderstood, how her case stands. This is generally only half attempted, and her friends too often interpret the physician's remarks as meaning that the patient is either malingering or laboring under some delusions or fancies. Consequently their management of her, with this erroneous impression, is fraught with disaster. The coöperation of a strong-minded, judicious relative, possessing tact and firmness, though not devoid of sympathy, but capable of suppressing her sympathetic manifestations, is of infinitely more value than all the drugs at our command.

The influence of such a mind operating upon the victim of hysteria can be guided by the physician in such a way as to strengthen the patient's will power, and enable her to successfully combat the tendency to yield to displays of emotional disturbances. Lecturing or scolding the patient continually is to be condemned. Each case must be managed as the judgment and tact of the physician directs. Sometimes the influence of the strong will of the physician may accomplish results which appear as miraculous. The writer had the satisfaction of being able upon one occasion to cause a patient who was bedridden for several years to get up and walk across her room, to the amusement of her relatives, who had regarded her as hopelessly paralyzed. There can-

not be a doubt that very many of the so-called examples of faith-healing are instances of this therapeutic power.

While upon the moral treatment of hysteria, the reader may glance at the remarks made under the head of Hypochondriasis, on page 380.

As regards the use of drugs in benefiting the general hysterical condition, it must always be remembered that they should be considered as of secondary importance when compared with the moral treatment. Valerian has long enjoyed the reputation of being the most valuable member of this class of remedies. To be of any use, however, it must be given in doses much above the strength of those usually employed. Drachm doses of the simple tincture, or an equal quantity of the ammoniated preparation, freely diluted, may be given three or four times a day.

The valerianate of zinc or of iron is undoubtedly the best remedy which we possess for constant administration in those cases of general neurasthenia or hysteria, whether occurring in the emaciated or plethoric subject. The writer has given the zinc salt in doses of 5 grains three times a day as long as the patient's stomach has tolerated it. After nausea or loss of appetite appeared to result from these large doses, he generally found the accompanying pill to be the most satisfactory routine treatment:

℞.—Zinci valerian.

Quininæ valerian. } āā gr. j.

Ferri valerian.

Ext. aloes aq. gr. ss.—M.

Make 24 of these.

S.—Take one pill, after meals, three times a day.

Asafœtida is sometimes very useful. Five grains in pill, morning and night, may be given, and should there be much constipation, 10 grains of the U. S. P. pill may be given at bed-time.

Musk is useless, and sumbul is generally disappointing.

Bromides are of little service unless in special cases to be mentioned. Their routine administration especially in lean or so-called neurasthenic subjects is productive of much mischief.

Strychnine is recommended by some authorities. The writer has used it extensively in varying doses, and never saw it administered without causing aggravation of the symptoms. Recently Ingals has reported marked success in hysterical aphonia by pushing the drug from doses of $\frac{1}{30}$ grain to $\frac{1}{10}$ grain until physiological symptoms appear.

Actæa, or cimicifuga, arsenic, pellitory, oil of amber, ignatia, camphor, galbanum, bromide of camphor, garlic, cocaine, antipyrine, and many other substances have been used in a routine way in hysteria. Those of them which the writer has tried have been useless or harmful. It is to be regretted that the multiplicity of so called remedies tends to divert the physician's mind from the moral and rational treatment of the disease, from which alone the best results are to be obtained.

Alcohol should be avoided, and narcotics are to be prescribed with caution, and such restriction should be imposed as will ensure the patient against the dangers of becoming enslaved to their use. The cocaine habit must also be guarded against.

Suspension has been tried in some cases, and reported upon favorably, but further experience is required before its utility can be established. It is carried out in the manner detailed under Locomotor Ataxia.

Before proceeding to detail the special treatment indicated for the various local manifestations of hysteria, a brief description of what is known as the Weir Mitchell Method may be given. By this treatment cases have been brought under easy and rapid control, which hitherto have been considered altogether outside the sphere of practical treatment.

The feature of greatest importance in this method is the *isolation*. This must be thorough and complete, only the nurse, physician, and masseuse being seen by the patient during the treatment. As a rule, it may be said that the other elements in the treatment are worthless without this strict isolation. Owing to the objections of the patient and her friends much opposition is encountered in carrying out this method in its entirety, but it may be advised that unless they agree to this rigid isolation it is useless to proceed with the plan.

The patient must be removed from her own home to an institution in which suitable provision is made for the reception of such cases, or she may be brought to comfortable lodgings.

The second element in Weir Mitchell's method is *absolute rest* in bed, the patient not being permitted even to stand upon her feet for a moment, just as if she were suffering from severe typhoid fever. She is not permitted to use her arms or hands, being fed by the nurse as a child. Letters, books, sewing, and other ordinary harmless occupations are forbidden for the first few weeks, after which she may be read to for a short time, and gradually these measures are relaxed; but for the first six weeks the horizontal position should be maintained in severe cases.

Overfeeding is the third feature in the treatment. Milk alone should be given for the first ten days, at frequent intervals, until enormous quantities are consumed. After three or four days sometimes 8 or 10 pints are swallowed daily. Strong beef-tea, chicken soup, meat jellies, tea, coffee, chops, fish, steaks, poultry, eggs, bread and butter, oysters, oatmeal porridge, vegetables of all kinds, puddings, and any form of plain, wholesome, digestible food are administered in very large quantities.

Massage is an important part of the treatment. It should be commenced upon the third day and be carried out in the most thorough manner, gradually extending the dose until an hour's good deep kneading of the muscles and tissues of the body can be borne by the patient. In bad cases, two applications or doses lasting for three-quarters of an

hour each, morning and evening, may be required. At the beginning it is well to confine the operations to the extremities, and the movements should be limited to the superficial structures. Afterward the deeper tissues and muscles may be kneaded until in a few days the entire body, excepting the head and face, receives a fair share of manipulation. In this way the blood and lymph circulation is greatly stimulated, effete products are washed away, waste materials being removed, and fresh pabulum brought with great rapidity to the refreshened tissues.

The enormously increased amount of nourishment is thus used up to the greatest advantage, and the patient's body-weight increases to an astonishing extent. Wasted muscles and emaciated limbs become plump and agile, and the change in the patient's aspect and dimensions is such in ten or twelve weeks' treatment as to tax the credulity of those who had not previously witnessed examples of the method.

Electricity is the last element in the Weir Mitchell plan of treating hysteria or neurasthenia. The uses of electricity will be more fully mentioned under the head of the treatment of the local manifestations in the following few pages. When used as a portion of this method, it is employed as an adjunct to massage. The interrupted strong current is selected, and the various muscles or groups of muscles are thrown into contractions.

This treatment has been productive of the greatest good in cases apparently hopeless, but, like every other powerful agent, its use has been abused, and in some cases the disease has been aggravated by its employment. As a rule, those so-called cases of neurasthenia (hysteria associated with great emaciation) are successfully treated by it. Stout subjects suffering from hysteria as a rule do not improve, and often get worse under its use.

For the special symptoms manifested in hysteria, special treatment may be demanded.

Convulsions. If the physician be called to a patient during an attack of convulsions or of hysterical coma, and if he be confident of the accuracy of his diagnosis, he can have the satisfaction of often bringing the fit to an abrupt termination.

The patient, if in bed or upon a sofa, is so placed as to enable the physician to pour a stream of cold water suddenly from a height upon her face without saturating the bed-clothes or garments of the patient. This free douching is soon followed by a return to complete consciousness, and in subsequent fits the mention of it is often enough to arrest all symptoms. Sometimes a tumblerful of cold water thrown forcibly against the face acts like magic; but the physician should state in the hearing of the patient that the application is to be repeated every two or three minutes until she gets out of her attack.

Catching the patient by the nose while the mouth is kept closed, so as to arrest the breathing entirely for a short period, may arrest an attack instantly. Strong liquor ammonia to the nostrils may produce the same effect.

Pressing deeply over the region of one ovary is said to sometimes arrest a fit of convulsions or of coma, but it often fails; and when it does appear to arouse the patient it leaves her in a very excited and excitable condition.

Electricity is of value if at hand; and by placing one electrode over the front of the neck and the other over the pit of the stomach, a smart interrupted current may stop the paroxysm in a few seconds. It has no such effect in epilepsy, and may be used, therefore, as a means of arriving at a positive diagnosis of the nature of the fit.

Hypodermic injection of apomorphine, to produce vomiting, has been recommended in hysterical opisthotonos.

Deep pressure upon the arteries and tissues at the base of the neck, so as to interfere with the cerebral circulation, as is sometimes successfully tried in stopping epileptic fits, may cut short the attack of hysteria or of hystero epilepsy.

While carrying out these measures, the room should be cleared of all active sympathizing spectators, and the physician should give his orders and carry out his operations without the least sign of hesitancy or wavering. This latter he cannot do unless he be very positive about his diagnosis; indeed, little can be done with hysterical patients as long as the physician has any doubt whatever lingering in his mind about the case being one of genuine hysteria. The patient by intuition recognizes his want of confidence in himself, as shown by some very trivial circumstance, and the result is that the demon refuses to be exorcised.

Where the coma has lasted for a considerable time, and the douche or electricity has failed, the application of a hot cautery iron gives prompt results. The writer has cut short attacks of both convulsions and coma by giving directions, in a loud and firm tone of voice, for the heating of an iron and the ordering of a portion of the skin to be exposed for cauterization. He has, however, never seen a case where the actual carrying out of this measure appeared to be justified. Nitrite of amyl sometimes arrests the paroxysm.

After the arrest of the paroxysm of coma, or convulsions, or delirium, much remains for the physician to do. The patient should be compelled to attend to all those points already detailed in the commencement of this article, and she should have full doses of the ammoniated tincture of valerian, with some asafœtida, administered at short intervals. The valerianate of zinc, in 3 grain doses, may afterward be prescribed for several weeks.

The following nauseous and disgusting combination may be tried:

℞.—Tinct. asafœtida ℥j.
Tinct. valer. ammon. ℥ij.
Olei terebinthinæ ℥ij.—M.

S.—Take a teaspoonful in a wineglassful of water every second hour (shaking the bottle).

Local paralysis should be treated by the means recommended as useful for the general hysterical condition. Massage, passive motion, and electricity, locally employed, afford, in conjunction with moral treatment, the best hope of success. The same measures prove useful in dealing with contractions or flexions, which are also successfully removed by the application of a circular blister around the joint. The method of employing these therapeutic agents will vary with the locality and nature of the affected parts or organs.

Aphonia yields readily to electricity, which may be employed in various ways for the treatment of this affection. By the aid of the laryngeal mirror one electrode is placed in contact with the vocal cords, the other being fastened to the outside of the larynx. By a button in the handle of the interior electrode the current is turned on, and the shock often causes the patient to instantly find the use of her voice, perhaps for the first time for many months. The applications should be repeated until the aphonia entirely disappears. Sometimes one sitting of a few minutes suffices, but more commonly several are required to insure that no return of the aphonia occurs. The faradic or interrupted current should be used, and contact may be made five or six times during each sitting. (See also under Aphonia on page 50.)

In the absence of the special electrode required for carrying out electrization of the vocal cords, good results may be obtained by passing a smart interrupted current through the larynx by means of moistened sponge electrodes placed externally over each side of the larynx in the neck. Static electricity may be used; it is, indeed, in this case much more certain than galvanic currents, and its effects are more lasting. It may be used in a variety of ways, the simplest being that of passing a series of shocks through the larynx from a Leyden jar. As the aphonia is, however, only one of the many manifestations of the hysterical state, it will be advisable to administer the static electricity in a way that will affect the entire system. The simplest and mildest method of using it is to place the patient on an insulated stool, or in an insulated chair, and by means of a brass rod held in her hand to connect her body with the prime conductor or condenser of a Carré, Holtz, or a Wimshurst machine. This is called the "static bath." When the surface of the patient's body becomes thoroughly permeated by the positive fluid, the physician approaches with a large wooden ball which he holds at about the distance of an inch from the patient's skin, the electricity passes from the patient through the ball and the operator's body to the ground without producing pain. This is known as the "electric souffle."

To produce the "electric spark," a metal ball electrode or metal point is brought sufficiently near to the patient's body to cause a sudden discharge of positive electricity.

In hysteria excellent results have been obtained by Dr. McClure. His routine method of procedure is to insulate the patient, and for the

first two sittings to administer the "bath," afterward by bringing the wooden ball close to the skin, but not close enough to produce a spark, he moves it in all directions over the body. When the paralyzed part or an area of anæsthesia is approached, the ball is laid aside, and sparks (light or heavy) are extracted by means of metal electrodes. In this way sparks may be extracted from the larynx in hysterical aphonia with much advantage.

Owing to the difficulties in working with static machines, static electricity has not received the attention which it deserves.

General faradization may be employed in hysteria, as static electricity is administered by the static bath.

The patient stands upon a large metal disc or moistened sponge electrode connected with the negative pole of the battery. While the physician places himself in connection with the positive pole through a wire held in one hand, with the other hand he holds in contact with the patient's body a large metal ball enveloped in a moistened sponge. The current thus passes through his body, and also through the patient as it passes from pole to pole. Either the galvanic or faradic current may be used.

These are the principal ways in which electricity is employed in hysteria, and it is often impossible to tell which method is the best in a given case until it has been tried. Each method is also capable of being varied. Thus in the treatment of neurasthenia cerebralis, where insomnia is the chief trouble, static electricity may be administered by holding the large wooden ball in front of the forehead of the patient sitting in the insulated chair, or the metal cap electrode may be used with great advantage. The writer has had excellent results in such cases by passing a weak, continuous, or galvanic current through the brain by using two sponge electrodes outside the skull, or connected with four or eight large Leclanché cells. The use of what is known as "static induction" is not yet sufficiently recognized therapeutically to warrant a description. The same may be said of the nature of galvano-faradization.

For ordinary cases of paralysis occurring in limbs in hysteria the use of the interrupted current *locally*, generally meets all the requirements of the case. Cutaneous hyperæsthesia and anæsthesia may be dealt with in the same way. When these fail, the general methods should be resorted to with the treatment already mentioned.

HYSTERO-EPILEPSY.

This formidable affection can only be hoped to yield to the measures already enumerated when discussing the general treatment of the hysterical condition. The writer has had splendid results from amyl nitrite in stopping the attacks in one well-marked case of the disease. Pilocarpine, hypodermically, has been used to cut short the convulsive attacks. In preventing the attacks, bromides and arsenic were decid-

edly useful, but total absence from alcohol and butcher's meat gave better results than drugs.

ICHTHYOSIS.

Internally, drugs are practically useless. There are some physicians who have still a remnant of faith in arsenic and cod-liver oil, but it is to local treatment that the physician must look for amelioration of the symptoms of this disorder.

All the dead epithelial products should, as far as possible, be removed before any local remedies are applied. This is best carried out by prolonged immersion in a warm weak alkaline bath, with the free use of a pure soft soap, and moderate friction by means of a soft hair bath-glove. The Turkish bath may be afterward employed with advantage, or any form of convenient hot air or vapor bath may be used. When the scales or plates have been removed, a bland, unirritating animal oil or fat should be gently rubbed in until the skin is brought to the natural suppleness. Lard oil or neat oil is the best, but any vegetable oil may also be used, and a pure olive oil, such as is used for salads, is free from objectionable odor. Vaseline or glycerin may be used for the exposed parts of the body, but upon the whole, the face and hands are best treated by pure lanoline, which should be gently rubbed in until it disappears.

The bath should be used once each day for long periods, but the inunctions should be performed twice a day. When the skin has been brought to its natural feel and appearance, a hot bath once or twice a week and a daily application of the oil will keep the subject of simple ichthyosis in a tolorably comfortable and presentable condition. Mild cases get on with one thorough inunction in the week. In a case occurring in a weak, thin boy, the writer had an excellent result from one thorough application of cod-liver oil every week. Suet or cacao butter answers well in some cases.

In severe cases of ichthyosis hystrix, where there is much hardening, the callosities may be gently scraped or rubbed down with a curette, or dissolved by application of a lotion consisting of one part of the liquor potassæ in two parts of water.

Salicylic acid, dissolved in collodion, may be more conveniently used to destroy the growths, and it will not cause injury to the underlying skin. After the removal of the cakes, an ointment containing 10 grains of iodide of potassium in solution, rubbed up with 1 ounce lanolin, may be used with advantage. Ichthyol and resorcin (10 per cent.) or naphthol (5 per cent.) ointments may be tried in the later stages of treatment. Pilocarpine, hypodermically, has failed to give any result to warrant its prolonged trial.

Where eczema complicates the case, the red, weeping fissures must be treated by emollients before resorting to frictions.

ICTERUS—See Jaundice.

IMPETIGO.

As there is always present some considerable departure from health upon which the pustular eruption depends, the treatment should be directed to the cause. The diet should be plain and nutritious without being too stimulating. Fresh air, exercise, and every means by which the standard of health can be raised, should not be neglected. Anæmia, constipation, dyspepsia, and other troubles are to be met by appropriate remedies; and tonics, with cod-liver oil and malt extract are afterward to be given.

Locally, the treatment may be rationally carried out by regarding the disease as if it were a purulent eczema.

The remedies suitable in eczema impetiginoides are indicated. After removal of scabs or crusts by warm fomentations if the case has been neglected, the seat of the eruption should be generously smeared over with ointment of zinc, or with a cream made by rubbing up equal parts of lime-water and olive oil with oxide of zinc, or carbonate of zinc.

When the scalp is affected, warm bread and water poultices will be often required in addition to persistent sponging until the crusts are removed, after which the hair should be cut close, and an ointment consisting of one part of white precipitate ointment and three parts of zinc ointment should be freely applied. Impetigo contagiosa yields to the same remedies.

IMPOTENCE.

When this arises from surgical or mechanical causes operative measures may remedy the failing. The cause, when not depending upon mechanical obstacles, should be ascertained before treatment is attempted. Many of the cases seeking advice from the physician are in those recently married, and much mischief may be done by the administration of powerful drugs under these circumstances. The situation arises from ignorance and nervousness, and produces sometimes a dangerous depression of spirits. The vast majority of cases of this nature right themselves in a few days if left alone, and all that is generally necessary is a little sound advice and no drugging. The stereotyped instruction to rigidly abstain for a time from all attempts at sexual intercourse is a mistake, unless under special circumstances; nature generally sets matters right in a short time. This is especially true in those cases where emission occurs before penetration has taken place, and then a successful coitus may take place when the act is attempted again within a short time after failure.

Moral treatment is all that is necessary in most cases where the incapacity is imaginary. Where impotence arises from previous recent excesses, but where the generative organs have not apparently suffered

structurally to any obvious extent, total abstinence from all attempts at intercourse must be rigidly advised until evidence is forthcoming that nature means to assert herself. During this period vigorous exercise, with good living, abstinence from alcohol, with the daily use of the cold shower-bath or sea-bathing and tonics, are very useful.

Of tonics, iron, in full doses of the tincture of the chloride in combination with strychnine, is the best. Easton's syrup of the phosphates is a valuable preparation. It should be given in doses of at least one drachm three times a day.

The ordinary members of the aphrodisiac class, as a rule, do harm, and should not be prescribed in these cases. The mere production of an erection is a very different thing from power to perform the sexual act successfully, and these artificial aids generally fail, and after each failure the position of the patient is decidedly worse. For this reason he should be urged not to attempt the act until he feel that he has reason to believe that the attempt will be more successful than the last. In most cases the patient's own sensations will be his guide in this point.

If, however, this treatment fails to cure the impotence, other measures remain, and these may at once be resorted to without waiting in those cases of impotency occurring after middle life, or in those who have indulged in sexual excesses, or in masturbation to the extent of causing atrophy of the testicles or penis. In such cases there is often weakness of sexual desire, but sometimes it is not diminished, and the physician finds that the mental despondency associated with the impotence is so serious as to call for active treatment.

Next in value to abstinence and the general hygienic measures just mentioned is electricity in the treatment of premature loss of virility. This remedy may be used in various ways. The writer has observed that the best results follow from the use of a moderately strong continuous current. One large sponge-electrode being placed over the lower end of the spine, the other is applied to the groin, spermatic cord, testicles, penis, and perineum in succession. The sitting should last for twenty minutes, and may be repeated twice a day. The interrupted current may be employed occasionally with advantage for the space of about a week, during which the continuous is suspended.

Massage, or gentle kneading of the scrotum and testicles, followed by free sponging of the parts with cold sea-water twice a day, has a decided influence in improving the tone and nutrition of the generative organs, and should always be tried in conjunction with electricity.

Benefit may sometimes be obtained from the wearing of a good Pulvermacher chain battery around the pelvis or loins.

Where the secretion of the testicles is not impaired, and where there is no abnormal deficiency in sexual appetite, the incapacity being mainly or entirely caused by some error in the apparatus necessary for erection, authorities speak highly of cantharides in small

doses—2 to 3 minims of the tincture—or of phosphorus. The writer has never prescribed these remedies for this purpose, and is doubtful of their utility. Of the so-called aphrodisiacs there is only one, in his opinion, which exerts a decidedly beneficial and harmless action in loss of virility arising from early sexual excesses or premature decay—he has tried it with success which warrants its recommendation in such cases—viz., damiana.

This is a Mexican plant, the *turnera diffusa*, which appears to act as a mild stimulant to the genito-urinary centres in the cord. (See author's work on *Materia Medica*, fifth edition, page 555.) It may be given in doses of 1 drachm of the fluid extract (1 : 1) three or four times a day, or the following combination may be prescribed with advantage:

℞.—Ext. damianæ fld. ℥ ijss.
Tinct. nucis vomicæ ℥ vj.
Glycerini q. s. ad ℥ iv.—M.

S.—One drachm three times a day after meals in a wineglassful of water.

Ergot, sanguinaria, turpentine, serpentaria, cubebs, and other vaunted remedies are worse than useless. Where the impotence occurs in conjunction with some organic or functional disease, it may reasonably be expected to pass off when the affection is removed, and it is needless to say that appropriate treatment should be directed to the mischief of which it is symptomatic. Thus, in diphtheritic paralysis, lead poisoning, and renal affections, impotence may be the condition which first directs the patient's mind to the attack.

In those cases where the loss of virility supervenes upon head or spinal injuries, the best hope of success will lie in the judicious administration of small doses of the bichloride of mercury ($\frac{1}{40}$ grain), or possibly of $\frac{1}{24}$ grain of the chloride of gold and sodium salt, or of 5 grains of the iodide of potassium. Phosphorous should be used with the greatest caution in such cases. After a few weeks or months of this treatment, the use of a weak continous current, passed through the cerebrum for a few moments and followed persistently with galvanism of the spine from the head to the sacrum, will accomplish all that drugs can be expected to achieve. A prolonged sea voyage or suspension, as for locomotor ataxia, may be tried. It has been noted that in locomotor ataxia, after suspension, in some cases impotence for a time disappears. The writer has, however, observed the temporary disappearance of impotence in one very advanced case, where the symptom had been marked for many years. In this case suspension had not been tried.

INCONTINENCE OF URINE.

Where this is caused by surgical affections, as stone in the bladder or prostate, the obvious treatment will consist in the removal of the

cause. Where the incontinence is simply the dribbling from an over-distended bladder, the result of urethral or prostatic obstruction, the only measure of any value is the judicious and regular use of the catheter.

Incontinence in children is a very troublesome affection, but in the great majority of instances it will be found to yield to treatment. It is a mistake to regard it as an affection chiefly confined to boys. In the writer's experience he has met with it more frequently in girls and in the neglected children sent into industrial or charity schools, when it is often found in its worst forms to be associated with a low standard of intellectual development.

The absence of any structural cause being determined, either by an examination or careful analysis of the symptoms, the physician should minutely inquire into the state of the bowels. Threadworms in the lower part of the rectum may be keeping up the contractions of the bladder, and they should be cleared out by small enemata of common salt dissolved in tepid water. In boys, an elongated, contracted, or adherent prepuce should be treated by circumcision or dilatation, preferably the former.

Any abnormal condition of the urine should be carefully looked for and must be met by appropriate remedies. In very acid urine great benefit may be obtained from the free administration of alkalies in full doses during the day-time.

The diet should be plain and unstimulating, late meals, and especially fluids before bed-time, being forbidden. Restricted diet is a mistake. A careful nurse or mother soon finds out what articles of food or what beverages are followed by any aggravation of the symptoms, and these can be avoided. As a rule, a strong animal food dietary is objectionable, but some children are worse upon a pure farinaceous diet, with slops. The child should be put early to bed, after a free evacuation of the bladder, and lifted by the nurse in three or four hours again, and awakened, so as again to have the act of micturition performed. Early in the morning this may be again seen to. The bed-clothing should not be too heavy, and a hard mattress is preferable to feathers. The child should be taught to lie upon either side, and sleeping upon the back may be prevented by fastening an empty cotton-reel or spool, by means of a tape, round the chest. This will awake the patient when he turns over upon his back during the night, and feels the hard substance pressing against his spine. This succeeds in grown-up children, and is a valuable plan in adults suffering from seminal emissions, but it may be tried with very young children.

Punishment should be forbidden. Such a measure is both cruel and useless, except under *very* exceptional circumstances.

Blisters applied to the sacrum are generally useless. Dr. Harkin has recorded successes in some most obstinate cases by painting over the upper cervical spines with blistering collodion.

Mild cases yield to the above hygienic measures without internal remedies, but most cases require the persevering use of drugs.

Belladonna or atrophine is the best remedy, but as ordinarily administered it is useless. To be of service it must be pushed until the physiological action of the drug is obtained in a mild form. It can only be of use in doses capable of partially paralyzing the bladder. Children bear belladonna well, and some show remarable tolerance of the drug. There is, therefore, great difficulty in proportioning the proper dose, and no rule can be given to fix the quantity exactly for any given age.

The U. S. P. tincture should always be employed, and a child three or four years old may get 2 minims in the afternoon and again in the evening before bed-time. This may be gradually increased until 6 or 7 minims may be reached, if dryness of the throat and dilatation of the pupils are not observed. Indeed, it is this great difficulty in arranging the dose of the drug which has led to failure. The physician must be careful not to leave the increasing of the medicine in the hands of inexperienced nurses.

Too often the physician, through timidity or carelessness, allows the case to go on from bad to worse, when a little attention and perseverance would crown his labors with success. There is practically no danger in increasing the dose and keeping up the action of the drug for two or three weeks, after which it may be gradually diminished, as the bladder soon recovers its normal rhythm when the micturating habit has been thoroughly broken for a short time.

There is, however, one important point in the administration of the drug which should be remembered. The tincture is made from the dried leaves, and these contain very varying amounts of alkaloid. Should a weak preparation be commenced with, and increased in quantities until, say, 8 or even 10 minims had been reached, and then a new sample of the tincture be obtained from another chemist after the first had been used up, a stronger preparation might lead to unpleasant results. It will be worth while to see that the same sample of the tincture be used throughout the treatment of the case.

Some physicians recommend the hypodermic injection of atrophine One minim of the solution (1 : 100) may be injected in a child of four years, 2 minims in a child of ten years, and 3 minims in the case of a child of fifteen years. These doses should not be exceeded in the first instance; they may be best administered three or four hours before bed-time, and half the quantity may be again injected just before bed-time, if no dilatation of the pupil has been produced. Bromide of potassium has now and then given good results, but is very much inferior to belladonna. It may, however, be combined with it advantageously. The following mixture may be prescribed for a child seven years old :

℞.—Potassii bromidi ℥v.
Tinct. belladonnæ ℥ij.
Syr. simplicis ℥j.
Aquæ aurantii flor. ad ℥iv.—M.

S.—A teaspoonful to be taken every evening at bed-hour.

Chloral hydrate has been highly recommended—the writer has found it to increase the mischief. Like cannabis indica, opium, codeine, and other narcotics, it would appear as if the dreaming, which follows the administration of narcotics to children, is very liable to excite the bladder.

Rhus aromatica has recently given excellent results. Unna states that it acts upon the muscular fibre of the bladder. The writer has used it in the case of a young adult with considerable amelioration of the symptoms.

The fluid extract (1 : 1) may be given three times a day in doses of 5 minims to children under two years, and 10 minims to children of eight years old.

Rhus toxicodendron in small doses has been found to check incontinence of urine, but in no way is it superior to the rhus aromatica, and may cause irritation of the stomach and bowels.

Buchu, cantharides, ergot, turpentine, creasote, lupulin, nitrate of potash, strychnine, and many other drugs have been used with little success. As a rule, it may be said, they fail where belladonna fails. Antipyrine has been said to give success, and lycopodium, in the form of tincture, has been extolled.

The methods of painting the orifice of the urethra over with collodion, or of encircling the penis with plaster or an elastic band, hardly warrant further trial.

Electricity has proved very useful in some cases, but its effects are transient. Picard applies one pole to the membranous part of the urethra in boys, and to the entire urethra in girls, and places the other pole on the hypogastrium, and records brilliant successes.

Where belladonna and rhus fail, Sir Henry Thompson's method of freely cauterizing the urethra is almost sure to succeed. Before this is resorted to a sound or bougie may be passed, and this sometimes answers the same purpose; it may be passed daily for a week. When no improvement results, a solution of nitrate of silver (10 grains to 1 ounce) should be injected by a catheter passed down to the prostatic portion of the urethra. In girls the solid nitrate of silver may be used to the urethra. In young women 3 grains of the salt, dissolved in 1 drachm of water, may be injected after the bladder is thoroughly emptied, and repeated in ten days again; and good results have been obtained by Sims's method of dilating the bladder to its fullest extent by means of large injections of warm water. The injections are made by forcing in a stream of water through a catheter by means of the ordinary elastic enema apparatus, the treatment being kept up until 20 ounces

of the liquid can be endured. The writer has had no experience of this treatment, and would be very slow to try it.

Recently Gersuny has relieved incontinence by twisting the orifice of the urethra in the female. The passage of an ordinary sound at regular intervals has sometimes given good results. After the cessation of the incontinence, iron, arsenic, nux vomica, and other tonics may be given with advantage, and very good results may be obtained by full doses of strychnine after a decided impression has been made by the administration of belladonna or atrophine, pushed to the extent of producing their physiological effect.

INFLUENZA.

Different epidemics vary so widely as regards the nature and degree of the symptoms that it is difficult to formulate rules applicable to future visitations of the malady. Thus, in the late epidemic which has passed over the greater part of the world, catarrhal symptoms were for the most part absent; in former outbreaks catarrhal symptoms have been prominent, and this will, perhaps, in the future, be also true. There are, however, fixed features in every epidemic which indicate clear lines for rational treatment. Foremost among these is *prostration*. The late epidemic has afforded ample opportunities of studying this symptom, which was invariably the most prominent and the only feature constantly present. This is not the place for the introduction of theories concerning the pathology or etiology of this wonderful epidemic, nevertheless, the conclusions arrived at by the writer, after a most extensive experience of the outbreak, bear so directly upon treatment that they may be mentioned. It is highly probable that the disorder is caused by a microbe, and that the striking prostration is the result of the action upon the nerve centres and muscles of the poison which it manufactures during the brief period of its growth and development. The symptoms are not unlike what occur in diphtheritic paralysis, and the indication is the same—to promote elimination and to keep up the strength of the patient from the very first with the most sustaining diet, as concentrated beef essences and nutritious soups, etc. The intense headache and pains in the back and limbs, even when there is not any fever present, should be relieved by moderate doses of antipyrine (15 grains), administered at the beginning of the attack, and half this quantity given every four hours, generally afford very speedy relief. The action of the drug upon the skin hastens the elimination of the poison and cuts short the course of the affection. The patient should be put to bed at once, and warm clothing and a little hot stimulant assist the action of the drug.

Complications, such as pneumonia and bronchitis, are apt to be of a very asthenic type, and demand stimulating treatment, with brisk counter-irritation. Depressing expectorants, like antimony and squill, should be avoided, and pulmonary congestion, which often exists without passing into pneumonic consolidation, can be best met by full doses

of quinine, in conjunction with teaspoonful doses of the aromatic spirit of ammonia, given mixed with a little whiskey or brandy, and well diluted with water. The following is a safe and efficient stimulant in such cases:

℞.—Ammonii carbonatis ℥iv.
Tinct. cinchonæ ℥jss.
Spt. ammon. aromat. ℥iv.
Decocti cinchonæ ad ℥xij.—M.

S.—One ounce to be taken during effervescence with half an ounce of lemon juice every four hours.

Vomiting should be relieved by sinapisms on the stomach region and ice in small quantities, along with champagne. Hydrocyanic acid should not be given for this purpose, owing to the cardiac weakness generally present.

Rheumatic symptoms, such as severe joint pains, if not relieved by the early doses of antipyrine, may be treated by 20 grains of the salicylate of soda every four or six hours.

Diarrhœa should not be interfered with unless it becomes excessive, when the dilute sulphuric acid (30 minims) may be given in combination with tincture of opium (10 minims) after each loose motion. Should the motions still continue frequent and excessive, 10 grains of the extract of hæmatoxylon may be ordered in combination with 1 grain of opium. Acetate of lead or other astringent (see under Diarrhœa, page 190) may be given.

Alison had great success with tannic acid in doses of 30 grains three times a day.

Food and stimulants in severe cases should be administered with regularity and persistence, and even rectal feeding may be required in very bad cases. It is of the utmost importance that the patient be seriously cautioned to remain in bed or in his room until convalescence is established. Many lives were sacrificed in the late epidemic by patients exposing themselves outdoors before the prostration had passed away, pneumonia being commonly the result. Isolation is supposed by some to be unnecessary, as the progress of the outbreaks generally proves that the disease is not carried from person to person as in ordinary epidemics of scarlatina, typhus, or smallpox. The writer, however, satisfied himself thoroughly during the late epidemic that the pneumonia which followed the attack of influenza was distinctly infectious, and this complication or sequela should be treated by strict isolation.

INGROWING TOE-NAIL.

In mild or trivial cases the trimming or clipping square off the free margin of the nail, scraping of the dorsal surface with the edge of a bit of glass or with the knife, so as to reduce its thickness to produce a

tendency to curling upward or backward of its lateral margins, and the removal of any cuticle accumulated under the lateral edges of the nail, are all that are required to give relief and prevent further progress of the mischief.

Pressure must be avoided in all cases, and the boot should be made sufficiently roomy, to prevent it pressing against the tender part, by having the inner margin of the sole so made as to end in a good square toe; the modern fashionable tapering-toed boots are the cause of ingrowing toe-nail in many instances.

Where ulceration has occurred, a minute roll of lint shreddings should be neatly packed down between the tender overhanging skin and ingrowing edge, so as to insinuate itself under this edge and cause elevation of it. Strapping should be then applied, so as to retain the lint in this position and at the same time to drag upon the overhanging integument and keep it pulled away from contact with the ingrowing edge. The lint may be removed at the end of a few days and the space filled with boric acid powder, iodoform, nitrate of lead, alum, oxide of zinc, or with the following powder:

℞.—Pulv. iodoformi ʒiv.
Calaminæ præp. ʒij.—M.
S.—To be used as directed.

Exuberant granulations may be destroyed with nitrate of silver, sulphate of copper, strong solution of chloride of iron, pure carbolic acid, or acid nitrate of mercury. Sometimes repeated applications of these caustics may, at the same time, destroy the sharp ingrowing edge of the nail.

Where caustics fail, cocaine having been applied freely, or the part being frozen with the ether spray, the overhanging granulations and integument may be shaved clean off by means of a sharp scalpel, and the wound left to heal under antiseptic dressings. This method, if skilfully performed, often gives better and more lasting results than those following the operation of evulsion of the nail.

There are decided improvements upon the old-fashioned method of inserting a roll of lint between the granulations and the *under* surface of the ingrowing nail. The best of these is carried out by using thin sheet lead instead of lint. A third layer of beaten-out silver also answers very well, but tinfoil is still better. It should be inserted under the edge of the nail, so as to thoroughly elevate it. This can rarely be accomplished at the first application, but in a few days the amount packed under the edge may be increased until the required elevation is accomplished. At the same time the foil may be gently packed in between the sharp edge and the overhanging granulations, the part dusted over with iodoform and enveloped in strips of plaster. It need not be changed for several days. This method, if carefully adopted and persisted in, generally removes the trouble. Where,

however, it fails, and the nail is loosened by the ulceration involving a considerable portion of the surface of the matrix, there remains the operation of removal of the nail. This is easily accomplished, when the patient is fully under the influence of an anæsthetic, by inserting one blade of a pair of dressing forceps under the centre of the nail to its root and securing a firm grip as the blades are closed, and by firm traction the nail is removed. There is great temptation to pare or shave off a strip of the nail parallel to and including the ingrowing edge, but as a rule this does not lead to any permanent benefit.

Sometimes one-half of the nail may be removed, after previously cutting it into two, by inserting one blade of a pair of fine and sharp-pointed scissors under its centre and pushing it down to the root. The loosened portion may then be easily removed by the forceps. Powdered boric acid being freely applied, the wound may be enveloped in lint moistened with alcohol and water, and surrounded with oiled silk.

Cotting's method of treatment is radical and successful. It consists in removal with the knife of the diseased fleshy parts, together with a large and thick slice of the healthy and adjoining side of the toe. The cut should extend far back and be guided by the edge of the nail, which should be exposed but not injured by the incision.

Hofmann has recently treated ingrowing toe-nail by pouring a few drops of a strong solution of ferric chloride upon the ulcerated spot, after elevation of the nail by means of bits of cork. The part is then permitted to dry, and the application repeated on the next and following day after. In a few days, upon removal of the resulting hard crust, the nail is found to be soft and friable, and easily removable with scissors. The writer has no experience of this method, which does not promise to supersede the older plans of treatment.

More recently the following plan has been reported as most satisfactory by Pürckhauer; it is bloodless and painless, and does not cause the patient to lie up. The nail is moistened with a warm 40 per cent. solution of caustic potash, and in a few seconds, as the surface becomes soft, it is scraped with a piece of glass, after which the solution is again applied and scraping repeated until the portion of nail to be removed is as thin as paper, when it can be lifted up with forceps and cut with scissors easily.

INSANITY.

To deal even in the briefest way with the treatment of the various forms of insanity is beyond the scope of the present work. Dementia, mania, melancholia, idiocy, moral mania, monomania, and their varieties, would require for a description of the necessary details of treatment space far beyond that at the disposal of the writer of the present volume. Moreover, these details can only be carried out in institutions specially designed for the purpose, and furnished with elaborate machinery for insulating, watching, nursing, dieting, exercising, amusing, and instructing the victims of mental disorders. To undertake the care

and management of insanity in the patient's home would be, in the vast majority of cases, a serious mistake, and a wrong to the patient, whose chances of recovery would be seriously diminished by such a proceeding.

The earliest possible removal to a suitable institution is of the utmost importance, and, as a rule, it may be said that in acute cases every day's delay diminishes to some extent the chance of permanent restoration. Where the patient's ailment is such as does not prevent his travelling and mixing with the public his early removal from home under the watchful care and close surveillance of a physician during a prolonged tour by rail or sea may be fairly tried with some hope of success before resorting to the restraints of an asylum. Such cases are, however, upon the whole rare where this method of treatment is available or warrantable soon after the outbreak of an attack.

The treatment of the various forms of insanity by drugs resolves itself into the judicious administration of remedies, with the view to correct the many deviations from the normal physiological state which may exist either as the cause or as the result of the abnormal state of the mind. Thus tonics for loss of appetite, and cod-liver oil, iron, and other restoratives are indicated when emaciation or anæmia exists. Narcotics should be avoided, except when pure hypnotics fail.

Sleep should, speaking generally, be insured. The favorite drug is chloral; but the writer, knowing its dangers when administered to sane patients, and having very little experience of it in insanity, hesitates to say anything in favor of it. Hyoscine has given excellent results in several large asylums, and the hypodermic injection of $\frac{1}{150}$ grain of Merck's pure hyoscine generally produces the most desirable calm and sleep. Dr. W. E. Finny has recently used hyoscine by the mouth with success, in combination with digitalis, in chronic mania. (See author's work on *Materia Medica*, 5th edition, page 572.) Sulphonal may be also used. (See under Insomnia.)

INSOMNIA.

A *concise* description of the treatment of this condition presents great difficulties, owing to the innumerable causes upon which it may depend. An elaborate description dealing with the treatment of all these causes would fill a volume many times larger than the present handbook. Hence reference will only be made to the treatment of sleeplessness depending upon the causes most commonly met with. It is hardly necessary to say that in every case the first thing is to ascertain, if possible, the cause of the insomnia, and in many instances its removal will be followed by the disappearance of the sleeplessness. Thus the writer has known insomnia to depend upon a cup of strong tea taken late in the evening, and the patient not suspecting the cause continued to drink tea until the insomnia became alarming.

Any sudden change in the hours of diet may be followed by insomnia; thus some patients cannot sleep after a late supper, while others fail to

get any sleep if they retire to rest with their stomachs empty. Sleep may only come to those who retire to bed immediately after wearying the brain, with active exercise. Others may be wholly unable to sleep if any previous mental activity has been indulged in. It is a very common experience to find among active brain workers that sleeplessness follows after taking a day of rest and calm, and often the freedom from care and repose of the Sabbath results in the loss of sleep for the night. This is, of course, an unnatural condition, and deserves serious consideration.

Mental anxiety, grief, exciting passions, dyspepsia, hepatic congestion, cardiac affections, many acute diseases, mania, insanity, delirium tremens, cerebral tumors, cold feet, and all conditions associated with pain, call not for treatment of the insomnia so much as for the relief of the above-named conditions which produce the insomnia.

A very common error is to confine the management of the case to the administration of narcotics and hypnotics. These should never be employed except when simpler measures fail. Especially in chronic cases, the last thing which the physician resorts to should be a narcotic or so-called hypnotic.

Regarding sleeplessness as the result of the transgression of some law of health, the patient's mode of life should be minutely examined with the view of finding out the transgression and remedying it. Unfortunately, the insomnia may remain for a considerable time after the cause has been removed. Wholesome diet, change of scene, a sea voyage, free open-air exercise near the sea if possible, and persisted in until fatigue is felt, the avoidance of all mental overwork, and as far as possible of anxiety and worry, should be advised.

The writer has found that a long, smart walk just before bed-time is an excellent hypnotic, if the patient upon finishing it retires immediately to his room, undresses without sitting down, and goes to bed. Cold feet must be warmed and rubbed until tingling is produced. Robust patients can dip their feet for a few seconds into cold water, and restore the local circulation by having them rubbed briskly with a coarse towel. Feeble people must generally fall back upon the objectionable hot-water jar or India-rubber bottle. Cold water bandages to the forehead or scalp seldom do much good, and may keep the patient awake by causing discomfort locally. A hard bed is often better than feathers, and a hop pillow may have a good moral effect. Where the patient tolerates it, elevation of the head is a decided advantage, especially where there is want of vascular tone. There are some who fancy that they can sleep better when their bed is placed due north and south. All sorts of devices are recommended for wearying the brain, such as counting up numbers, repeating verses, etc.

The influences of monotonous noises or vibrations to which the patient has been long familiar, as the hum of city traffic, the sound of machinery, of running water, etc., are often productive of good. The writer knew of an instance of protracted insomnia in the wife of a

blacksmith, which after failure of all hypnotics and absolute stillness, yielded to the music caused by the loud hammering of an anvil in the forge beneath her bedroom. He has recently had an hospital patient who could not sleep until she got a small and rather noisy clock from her home and placed it by her bed-side. Thus perfect quietude is not *always* desirable.

A copious warm drink or a cold water draught before lying down occasionally soothes some patients. The habit of reading oneself to sleep by the aid of some uninteresting author, though not to be recommended, is often efficacious. The absence of light is generally essential, and the morning sun should be shut out by blinds or shutters.

Massage is a powerful hypnotic, and the writer has seen very wakeful and neurasthenic patients fall asleep during the performance of it. Sometimes, however, massage may excite. Eccles's plan is the best. He advises thorough rapid massage of the abdomen, thighs, and legs, so that a temporary anæmia of the brain may be produced by the blood flowing into the dilated vessels of the manipulated regions. A warm or hot compress to the abdomen tends to prolong the dilatation of the abdominal bloodvessels, and sound, refreshing sleep often supervenes.

Hydropathy is a valuable aid in treating insomnia, and in some cases gives permanent relief. A warm bath should be taken until the patient is almost beginning to feel weak. He may then be enveloped in a flannel bath sheet, and when lying on his bed upon the top of the bedclothes his body should be perseveringly rubbed down by an attendant with a linen Turkish towel until a grateful sense of drowsy languor is felt, after which he should get under the bedclothes. The wet pack may be meployed for forty-five minutes with advantage, but it will be better to use a sheet wrung out of tepid or warm instead of cold water, as generally recommended. Friction with a rough warm towel should be afterwards employed, and the amount of over-clothing should not be such as to encourage profuse perspiration which may keep the patient awake. The local pack to the trunk may likewise be employed with advantage, and after getting to bed its good effects may be kept up by giving warm or hot drinks.

The cold douche has been recommended, and is valuable in allaying the cardiac excitement upon which the insomnia may depend.

Gellhorn uses a piece of calico, eighteen inches wide and nearly three yards long, rolled up like a bandage, and a third of it wrung out of cold water. With this he bandages the leg, the wet portion being carefully covered up by several layers of the dry part as well as by a layer of gutta-percha tissue, and a stocking drawn over the whole, the dilatation of the vessels which follows diminishes the amount of cerebral blood and induces sleep, especially where there is any cerebral congestion.

Electricity has in many cases given excellent results; it may be used in many ways. The writer employs a weak constant current of three or

five cells of a Leclanché battery, with one electrode on the forehead, and the other on the occiput for five, ten, or fifteen minutes. The interrupted current to the spine, alone or in conjunction with massage, has been used in some cases with satisfaction.

The best results, however, are obtained from static electricity. After insulation of the patient upon a glass stool, his body is brought into connection with the conductor of a Carré or Holtz machine, and when thoroughly electrified a fine metal point is held opposite several spots on the scalp and forehead not near enough to produce a spark. The sensation is as if a light wind or breeze was pleasantly playing over the region, and McClure has found sleep come on while this form of electric souffle was being employed. The production of heavy sparks is not necessary or advisable, but the use of the metal cap and static insulation gives the best results which can be obtained from electricity.

Where the above-mentioned remedies fail, the physician then feels himself driven to employ drugs of the narcotic or pure hypnotic class. The fear of creating a habit which may enslave the patient for life should always be kept before the mind of the physician, especially in cases where the condition has lasted for a long time. In dealing with insomnia of short duration, this is not at all a probable danger.

Of all the drugs ever used to counteract sleeplessness, there is not, on the whole, one so generally valuable as alcohol in some form or other. As remarked elsewhere by the writer, the various spirituous beverages have very different therapeutic actions, which cannot be explained by their alcoholic strengths. Thus for insomnia the various wines are inferior to whiskey, and brandy does not produce as good results as whiskey. Strong ale is highly hypnotic, and so is porter or stout. To obtain the best hypnotic effect from alcohol, it should be given in one full dose just as the patient has undressed and lain down in bed. It acts more certainly if given warm, but not hot. One wineglassful (2½ fluid ounces) of good whiskey, made into warm punch, and swallowed as a draught—not sipped in spoonfuls—is a most invaluable soporific. Where the physician has reason to dread the formation of the alcohol habit, it may be mixed with a bitter, or may be forbidden altogether after a short time; but the writer has not met with an instance where the patient has so suffered when the drug has been given with the above-named restrictions. The danger of intemperance is much greater when alcohol is ordered in smaller quantities to be taken with meals.

It is, moreover, surprising to notice, when the patient abstains from the use of alcohol at all other times, how the same dose may continue to produce its beneficial hypnotic effects without requiring augmentation for very long periods. Headache and malaise seldom follow, and when they do, they may be prevented by using a purer whiskey of greater age.

The product of the patent or silent still should be condemned. The amylic alcohol which it contains, though very small in amount,

does not mellow, or split up into the various ethers which develop during the progress of time in the liquid produced by the old pot-still.

With few exceptions, the drugs employed to produce sleep up until a comparatively recent date were selected from the group of narcotics, nearly every member of the group being more or less used for this purpose. The introduction of the pure hypnotics, whose properties will be mentioned later on, has marked an era in therapeutics. Nevertheless, narcotics must ever hold a high place, being invaluable in many forms of insomnia, where the pure hypnotics are useless.

Opium is the most prized member of the group, and its superiority over the new hypnotics lies in its power of relieving pain and distress. As a rule, it may be said that the new hypnotics have no influence over pain, and until it is relieved their action fails to induce sleep.

Opium possesses the power of relieving pain by preventing the conduction or perception of painful impressions, and sometimes this can be done by employing doses so small as to have no soporific effect whatever. As sleeplessness is so very often caused by pain in the innumerable instances of diseased action coming constantly under the notice of the physician, it must be used often to induce sleep, as in neuralgia, sciatica, pleurisy, cancer, angina, etc. In simple chronic insomnia, whether produced by mental over-work or occurring in the insane, and when not caused by or complicated with pain, opium or its alkaloids should not, as a rule, be employed.

As the present article deals chiefly with such simple insomnia, little space need be given to the discussion of narcotics. The danger of inducing the opium or morphine habit is so great in chronic insomnia that the indications for these remedies should be strong indeed to tempt the physician to prescribe them. Where the insomnia is of very short duration, and caused by mental worry or over-work, which is not at all likely to be repeated or become a habit—in short, where the cause is fleeting, or has already fled—opium is an invaluable hypnotic, and may be employed in such a case with great advantage. The dose should be a full one, 1½ or 2 grains of opium, or 30 minims of the solution of morphine (1 : 100). The dose should be given as the patient lies down, and darkness and quiet should be maintained. If sleep does not result in two, three, or four hours, the same quantity may be again administered.

When morphine is administered hypodermically as a hypnotic for the first time, a dose of alcohol should be given a few minutes before it, or 1 minim of solution of atropine (1 : 100) should be injected along with it. When pain is present, larger doses of opium or morphine are required, and it is, as a rule, better in such cases to repeat the dose at a shorter interval than to give one very large dose. In chronic bronchitis with profuse secretion, in the late stage of phthisis, in congested states of the brain with contracted pupils, and in all the ailments of childhood or infancy, opium is contra-indicated.

In the insomnia of delirium tremens opium or morphine may be given in large doses. (See page 167.)

In the painful insomnia of cardiac distress, hypodermic injections of morphine (¼ grain) often give great relief and sound sleep when every other hypnotic has failed.

In acute melancholia or mania, morphine is still employed, but the newer hypnotics are generally far better. Codeine, narceine, and bimeconate of morphine, and the various preparations of opium, as black drop, Battley's sedative, nepenthe, etc., may be tried where the after ill consequences of opium have been barriers to its use. Codeine is a very feeble hypnotic. Opium or morphine may be combined with most of the new hypnotics, and the writer has often relieved pain with small doses of morphine, and afterward induced sleep by 20 grains of sulphonal. The dose, even when the minor action of morphine only is required, will generally need augmentation, and this is one of the chief objections to to the use of opiates in insomnia and all chronic conditions associated with sleeplessness.

Meco-narceine is the name given by Laborde to a new hypnotic alkaloid obtained from opium, which is said to produce no headache or gastric disturbance.

Cannabis indica is open to nearly all the objections to which opium is liable, and hence it is not a suitable drug in the treatment of simple chronic insomnia. It does not, however, exert such deleterious influence over digestion, nor does headache so frequently accompany its administration even in large doses. Cannabin tannate is an excellent form for prescribing the drug in doses of 5 grains in the insomnia of mania.

Hyoscyamus has been long used as an hypnotic. It is but seldom employed now, unless in combination with bromides.

Hyoscine, which is the *amorphous* alkaloid obtained from hyoscyamus, and which forms crystallizable salts, is one of the most valuable of the hypnotics which have been recently introduced. It is now obtainable in such purity that a dose of $\frac{1}{150}$ grain administered hypodermically is a powerful soporific. The hydrochlorate or hydrobromate, as prepared by Merck, is the most trustworthy preparation. In acute mania and other conditions of grave excitement with motor disturbance, it is the most rapid and certain hypnotic known.

According to Krauss, after its administration the maniac collapses as if struck by lightning, but the calming down of the general paralytic is gradual, his restlessness soon settling down into peaceful slumber. The drug is not without its drawbacks, and though many observers assert that it has no influence upon the heart, nevertheless it is apparent that a remedy of such potency is not one to be employed in a routine way in the treatment of simple chronic insomnia. Some authorities have reported sharp, depressant effects from $\frac{1}{60}$ grain, and it will be wise to regard valvular disease as a contra-indication to its use. In insomnia associated with or depending upon a latent strain of insanity, hyoscine is the most reliable weapon in our armory. Webber gives the drug by the mouth, and the following formula may be employed in insomnia:

℞.—Hyoscin. hydrobrom. (Merck) gr. $\frac{1}{4}$.
Tinct. aurantii amar. ℥j.
Aquæ dest. ℥iij.—M.

S.—One measured drachm to be taken at bed-time.

This dose of $\frac{1}{64}$ grain of the hydrobromate by the mouth should not be exceeded at first. The best results have been uniformly obtained by the hypodermic injection of $\frac{1}{120}$ grain of the hydrochlorate. The dose may afterward be increased to $\frac{1}{80}$ grain. Deep, quiet sleep generally follows in twenty minutes, and lasts for six or eight hours without any after ill consequences.

Hyoscyamine is still occasionally used. It may be given in larger doses ($\frac{1}{50}$ grain) than hyoscine, to which, as an hypnotic, it is inferior. (See *Materia Medica and Therapeutics*, fifth edition, page 572.)

Bromides of potassium and sodium are certainly the least harmful of hypnotics. In mild cases of insomnia following prolonged mental activity and overwork, full doses (30 to 40 grains) of the potassium salt produce calm, deep, and refreshing sleep. In severe cases it very often fails, but failure does not leave the patient in a worse condition than if he had not taken the drug. The cases where its best effects are uniformly observed are those where sleeplessness is caused by over-mental activity—a state not of simple wakefulness, but where the brain is unusually active, and the mind excited by a rapid succession of brilliant ideas. This condition often supervenes upon the patient retiring to rest immediately after some mental effort or worry, without permitting a period of rest, during which the mental faculties should have been diverted into other channels. In this state there is some flushing of the face, and throbbing of the carotids and pulsations are felt in the cranium. The brain feels like an active galvanic battery, and new thoughts arise in rapid succession, and the patient feels a capacity for mental work to which he was unequal in the hours of the day. This is a very frequent occurrence in public speakers and debaters. If 30 grains of bromide produce no effect in an hour under these circumstances, the dose may be repeated, and if sleep does not soon follow, a full dose of warm whiskey punch will rapidly produce sound slumber. There is a state of restlessness of a totally different sort often observable in highly nervous patients after getting into bed, in which the slightest external stimuli call forth incessant and ineffectual attempts to dispose the limbs, head, or trunk in such positions as will give a sensation of comfort and tranquility. This, which might be called "acute fidgets," is controlled effectually by a few doses of the bromides, which probably act by diminishing reflex excitability.

The bromides may be taken for long periods without hurt. In one patient with a bad family history of insanity who suffered from insomnia, the bromide of potassium, combined with a small dose of tincture of hyoscyamus (20 minims), was steadily taken almost every night for

twenty-five years with most satisfactory results, and with no necessity for augmentation of the dose, and with no ill consequences.

Chloral has been extensively employed as an hypnotic in simple insomnia and delirium tremens. It is, perhaps, the most certain soporific which we possess when pain is not present. It is open, however, to two serious objections which probably will ultimately lead to its disuse as a therapeutic agent. These are the dangers of establishing a chloral habit, and the depressing influence which the drug exerts upon the heart. It directly affects the cardiac muscles, dilates the arterioles, and may injuriously affect respiration. These effects have frequently followed the medicinal doses still believed by many to be safe, and death has resulted. Generally sleep is profound and refreshing, and the after ill consequences are trivial. It acts rapidly, and the slumber may be prolonged to ten or twelve hours. Its depressant action should distinctly forbid its use in cardiac disease, in emphysema, and bronchitis, and in the late stages of typhus and typhoid insomnia, when the cardiac muscle is always weakened.

In mania and in the sleeplessness of the various varieties of insanity, its soporific virtues are so uniformly experienced that there is a great temptation to employ it in a routine fashion. Though many patients have taken it without any ill effects in these diseased conditions for many months, there is always a remote possibility of a lethal action upon the heart. This is especially liable to ensue when the dose has been increased, and the fact of its having been previously taken with great advantage is no safeguard against its depressant cardiac action upon some future occasion.

It acts rapidly, and should be given immediately before retiring to rest, and as some patients are very susceptible to its influence, it is wise never to begin with a larger dose than 20 grains.

It has been combined with morphine or bromides with advantage, and the writer believes that one or two ounces of whiskey given at the same time greatly increase its efficacy and materially diminish its power of depressing the heart. Some authorities strongly condemn the combination of chloral and morphine as the most dangerous of hypnotics. The writer cannot confirm this important judgment, as he so seldom gives the drug in insomnia, but it is worth being noted. The value of the bromides when given with chloral is above dispute, as a smaller dose suffices.

The following combination may be tried:

℞.—Chloral gr. xxx.
Potassii bromidi gr. xxxv.
Tinct. opii ♏ xxx.
Syr. aurantii flor. ʒiv.
Aquæ dest. ad ℥iij—M.

S.—The half to be taken at bed-time, and the remainder in three hours afterward, if necessary.

Butyl-chloral hydrate possesses many of the good qualities of chloral, and is less dangerous. It is, however, a decidedly weaker hypnotic unless where sleeplessness is caused by some painful condition of the fifth nerve. It is in these latter instances that it is generally employed, and as a pure hypnotic it has not met with a success warranting its administration, except where the more trustworthy agents have failed.

Chloral-urethane or ural is a new hypnotic obtained from chloral by precipitating a solution of urethane in chloral by adding hydrochloric acid. It is claimed for it that the urethane counteracts the depressant cardiac action of the chloral It produces deep sleep; but sufficient corroboration of the high praises bestowed upon it by Poppi has not yet been forthcoming. One effect reported does not auger well for its future use—it has been observed to lower the blood-pressure.

Somnal is the name given to ethylated chloral-urethane, which in 30 grain doses acts like chloral, and it is said to be free from its serious drawbacks.

Chloralamide is another new hypnotic prepared by combining chloral with formamide. It promises well, though the reports are still too few to base any strong conclusions upon. It is in the form of small colorless, odorless, slightly bitter crystals, soluble in water. Thirty to 45 grains is the dose most frequently employed, and it may be administered by the rectum without causing irritation.

Sleep comes on in less than one hour. It seems somewhat less powerfully hypnotic than chloral; but there is no dilatation of the arterioles or fall of blood-pressure, and as yet no depressant influence over the heart and respiration has been noticed. Like chloral, it would appear to possess some very feeble pain-relieving properties. It is indicated in the same class of cases as chloral and in simple insomnia. If it be found to be free from the seductive influence of establishing a habit like its ally, it will be a valuable addition to therapeutics. It has already been used as an hypnotic in heart diseases and bronchial affections; its hypnotic power is roughly calculated at two-thirds of chloral hydrate.

Chloralimide is the name given to a still newer hypnotic, which differs chemically from chloralamide. It is said to be more active than that substance, and more pleasant to take, and free from the objections of chloral hydrate; but it is still upon its trial, and we know practically nothing of its alleged innocence.

Sulphonal has been one of the most valuable of the many recent additions to therapeutics. It is a colorless, odorless, tasteless, insoluble salt, and may be given in doses of from 15 to 60 grains. It is the type of a pure hypnotic, and possesses no analgesic properties. In small doses it possesses the remarkable power of checking or preventing the night-sweats of phthisis.

In cases of simple insomnia uncomplicated with pain it acts with much certainty, and is altogether free from the objectionable qualities possessed by chloral. Thus experience has proved that no sulphonal

habit has been observed, and though it appears to have *slight* and insignificant cumulative action, there is no necessity for increasing the dose. Sleep does not come on immediately, sulphonal being very slow in its action, and sometimes three or four hours elapse before the soporific effect begins to manifest itself. The duration of its action is about that of chloral—six to eight hours. Professor Leech has drawn attention to the prolonged deferred action of sulphonal, which sometimes causes a drowsiness, which may last for a considerable part of the day following its administration. This is more liable to happen when it has failed to induce sound refreshing sleep after the usual interval. It has been very often noticed that this drowsiness extends into the following night, and some patients who use the drug constantly, find that it produces better effects upon the second night without taking any more of the drug in the meantime. Hence the writer has adopted the practice of only giving sulphonal in full doses every alternate night in simple insomnia. There is no depressant cardiac action, and the respiration and arterioles are not influenced. The only untoward effects worth mentioning are those which occasionally have been observed in the nervous system. Restlessness, hallucinations, vertigo, giddiness, and confusion of thought, have sometimes, though rarely, been noticed to take the place of sleep.

Ataxia with staggering gait has been several times noticed, and after full doses the incoördination has appeared to resemble drunkenness. In one highly nervous patient afflicted with severe insomnia the writer was informed that most miserable depression followed its administration; but this was in a subject in whom almost every known hypnotic had produced unpleasant or alarming symptoms.

These after-effects of sulphonal have not been known to lead further than to unpleasantness, and the innumerable host of reports which have appeared during the past few years seem to justify the hope expressed by the writer in 1888 that "the days of chloral hydrate are numbered."

Thirty grains partially dissolved in a little warm beef-tea or hot water should be given about an hour before retiring to rest. If a moderate dose of whiskey punch be substituted for the hot water the most unobjectionable and certain hypnotic combination will be obtained. When the alcohol is combined with it, the dose should be given as the patient retires to bed.

The writer has noticed that when dissolved in hot punch its effects are much more rapid; and recently a writer in one of the journals has pointed out that if dissolved in boiling water it will not fall down as cooling occurs. This is a valuable contribution, as the insolubility of the drug is its only drawback. The writer generally gives it in fine powder, made up as a sandwich between two pieces of thin bread and butter, and owing to the insolubility of it in this form, it should be given two or three hours before bed-time. If dissolved in boiling water it may be given upon lying down.

From the above remarks it will be noticed that the range of sulphonal is most extensive. It may be given in the sleeplessness of every disease where pain is absent, and it is, upon the whole, the best remedy for simple insomnia. In insanity, however, it is inferior to paraldehyde and hyoscine, in the opinion of those best calculated to judge, and in all depressed states of the mind its action is less certain. Sixty grains appear to be about equal to half a grain of morphine in hypnotic effect. It is the best soporific for children.

Paraldehyde is a pure hypnotic of great value. It may be regarded as practically free from danger and after ill-effects. Its most objectionable taste and odor are its greatest disadvantages. It may be given in drachm doses for weeks or months at a time, and the dose, as a rule, does not need to be increased. A paraldehyde habit has been observed to follow it habitual use in a few cases. It is indicated in every form of sleeplessness where pain is absent, and is the most reliably hypnotic in cardiac cases. In pulmonary distress it is inferior to sulphonal. In insanity, paraldehyde has undoubtedly given better results than any other drug, and its new rival, sulphonal, has been compelled to give way before it in the routine treatment of the insomnia of acute mania melancholia, and general paralysis. This is chiefly owing to the fact that the unpleasant nervous symptoms following sulphonal have deterred physicians pressing its administration in doses very much larger than the avery dose of 45 or 60 grains, while paraldehyde can be fearlessly given in doses of 4 to 6 or more drachms. Thus, Clouston has given it for a fortnight to a general paralytic in doses of 4 drachms.

It acts with rapidity, sleep lasting about six hours, and there are very little unpleasant sensations next day save the most disagreeable odor which it imparts to the breath. This is so obvious to those coming in contact with the patient, that it prevents its general use in simple insomnia. It may be given with mucilage or brandy.

℞.—Paraldehyde ℥j.
Mucilag. acaciæ ℥ij.
Syr. simplicis ℥ij.
Aquæ cinnamomi ℥xj.—M.

S.—The draught to be taken at bed-time, after shaking the bottle.

Capsules and suppositories have also been used.

Urethane has been much used as a perfectly safe hypnotic, and has been recently praised by Leech and Gordon as a remedy for mild cases of insomnia. The writer, like many others, has ceased to employ it owing to its uncertainty. Even in doses of 100 grains it very often produces no appreciable hypnotic effect. If we had no other harmless hypnotic it might still be urged that it should have further trial, but there is no reason why it should not be permitted to fall into disuse. It has been recommended to give it in combination with chloral, but chloral-urethane meets this suggestion thoroughly.

Hypnone is also a most unreliable hypnotic, and the same verdict may be safely pronounced upon its employment in insomnia, though sometimes it does seem to produce sound sleep. It has a most objectionable odor and taste. It causes so much gastric irritation that it cannot with safety be given, even in the form of capsules (4 minims), without producing pain or vomiting.

Acetal, owing to its uncertainty of action and its objectionable taste and odor, seems also unworthy of a place in the list of remedies for insomnia. Its dose is about 2 drachms.

Methylal, first introduced by Richardson, is a strongly smelling liquid, causing sleep in doses of about 3 drachms. It is very expensive. It is a weak hypnotic, and very often fails. Its sweet taste and rather agreeable odor contrasts favorably with these physical properties of the last-mentioned members of the hypnotic group. It is needless to say that as an hypnotic it will cease to be tried, as it has never had the chance of coming into general use, owing to its expensiveness.

Amylene hydrate is a colorless tertiary alcohol, which has been found to produce reliable hypnotic effects in doses of about 1 drachm. It is best given in claret or any weak wine, and it appears to act like chloral, without exerting dangerous depressant action upon the heart in ordinary doses. It acts very rapidly, but its unpleasant taste and expensiveness are barriers to its usefulness, though it has been found to give effects equal to those of paraldehyde in delirium tremens and melancholia. It can be, moreover, safely given to children.

Antipyrine and antifebrin have been credited with hypnotic influence, but where this has followed their administration, it has been probably brought about by their valuable analgesic action, sleep following naturally after pain was removed.

Chloroform and ether have been used with benefit in exceptional cases of severe insomnia, which resisted other hypnotics, but their use cannot be recommended, and obviously cannot be continued or kept up, even in the most exceptional cases. Ether may be tried in full doses by the mouth where other remedies fail. It is, however, uncertain as an hypnotic, and is liable to produce the ether habit, as seen in the cases of ether tipplers common in some parts of the North of Ireland.

Sumbul, musk, camphor, boldo-glucine, lupulin, lettuce, and many other drugs have been used from time to time with little success. When the previously mentioned hypnotics fail, these latter are useless. Digitalis sometimes helps sleeplessness by improving the tone of the cerebral arteries.

Hypnotism has been recently tried with success for insomnia, and great interest attaches itself to the future trials of this mysterious agent. There are cases of inveterate insomnia in the sane, which are occasionally to be met with, and which resist treatment by all hypnotics, owing to the failure of the drugs to induce sleep, or owing to the terrible depression following their action. Static electricity, massage, and the

other means enumerated at the commencement of the present article, if tried unsuccessfully, leave nothing but this last-mentioned agent as a last resource. In such cases, if hypnotism succeed even in giving temporary relief, an immense gain to therapeutics will result.

INTERMITTENT FEVER.

The treatment for this disease might be summed up in the word—quinine. Where the therapeutist wishes to point to an example of a "specific," he generally finds that the action of quinine in ague leaps at once into his view. When the first symptoms of an attack show themselves, at the very beginning of the cold stage, the important question arises: Can this attack be cut short? Most authorities are satisfied that it cannot, and that, no matter what remedies be used, the disease must take its course, and pass through the cold, hot, and sweating stages.

Nevertheless, there is abundant evidence that the attack may be very materially mitigated or modified in some cases by the prompt employment of remedial agents.

The patient should immediately be put to bed, and hot water bottles and warm clothing freely supplied. Hot drinks or warmed stimulants are useful. Nitrite of amyl and other nitrites very often stop the chill promptly, but do not appear to influence the succeeding stages. Pilocarpine in a full dose ($\frac{1}{4}$ to $\frac{1}{2}$ grain), administered hypodermically at the first onset of the symptoms, has been found in some cases to cause abortion of the attack. To be of any use, however, it must be given at the very commencement of the seizure. Atropine has been also used, but is not reliable. Chloroform, internally, in one full dose (20 to 40 minims), or one large dose of opium, has been also found to diminish the duration and intensity of the attack.

Bleeding, purging, blistering, cupping, and emetics, have also been found useful, but are now seldom employed. Moderate purgation should generally be prescribed, as it undoubtedly increases the efficacy of the remedies to be afterward given in the latter stages.

When the hot stage sets in, considerable relief may be obtained by removal of the extra clothing and the free sponging of the skin with cold or tepid water. Cold compresses are grateful. It does not appear that the new antipyretics have been of much use in this stage of the paroxysm.

In the sweating stage, gentle friction with hot towels and changes of underclothing may give some relief. After this stage is over, the patient may be permitted to get up and move about.

While there may be considerable difference of opinion regarding the utility of many of the above means being used with the view of aborting or modifying the early stage of the paroxysm, there cannot be a second opinion about the urgent necessity of prompt treatment for preventing the recurrence of the attack. All experience points to the conclusion that the subsequent difficulties are very greatly increased

when the treatment of intermittent fever has in the first instance been neglected.

As already mentioned, quinine is a specific for this disorder, and by a consensus of opinion it is maintained that to best prevent the paroxysms recurring, this drug should be given as soon as possible after the urgent symptoms of the seizure have passed off. Most authorities prefer not to wait until the symptoms of the paroxysm have actually subsided, but they advise that it should be given during the sweating stage. Ten grains should, therefore, be given in solution or in pills toward the termination of sweating stage, and 5 grains every four hours for three doses afterward, by which time the physiological effects of the drug will probably be manifested.

Rarely will larger quantities be required. It is a mistake to give large doses during the cold or hot stages. When vomiting is a prominent symptom there may be a difficulty in administering quinine by the mouth, in which case 20 grains can be given in the form of an enema. There is considerable difficulty in introducing the drug into the system by hypodermic injection. In the period of time, extending from the beginning of one attack to the beginning of the next attack (*i. e.*, the interval), about 20 grains is a fair average amount of quinine in ordinary quotidian ague. In malignant or pernicious intermittent fever 25 or 30 grains of may be given at once, and 10 grains in four or six hours afterward. The neutral sulphate in solution in warm water, or quinine dissolved in ether, should be injected when the stomach and rectum fail to retain, and in these malignant cases this remedy must be pushed at all hazards.

All the cinchona alkaloids are of value in ague, and the sulphates of quinine and quinidine being the most active are to be preferred to cinchona in powder, which owing to its bulkiness is apt to cause gastric disturbances.

The administration of the remedy should be pushed until there is conclusive evidence "that the paroxysms are broken." Afterward it should be continued in smaller daily doses for some months, until long after the thermometer and the absence of periodical increase of urinary salts have proved that the disease has disappeared. Upon the least sign of a return, it will be advisable to resume the administration of the drug in doses sufficient to produce cinchonism.

Though hosts of ague specifics have been recommended, it is rarely necessary to resort to any drug but quinine, which in the great majority of cases cut short the disease with rapidity and certainty. In malignant cases one is not justified in trusting to any other agent as time is an important element in the case, and death may supervene before any other remedy has time to act. Among the drugs found to possess marked antiperiodic powers next to quinine stands arsenic. It is sometimes found to cure when quinine has failed, and this is especially true if the ague is of the quartan type, or if it has been of long standing. Five minims of Fowler's solution may be given three times a day. It

may be combined with quinine in the treatment of the malarial cachexia.

Decoction of fresh unpeeled lemons has been proved to possess valuable anti-malarial properties, and may be given freely, alone, or in conjunction with quinine.

Salicin, beberine sulphate, apiol (20 minims), narcotine (1 grain), camphor, capsicum, grindelia, hydrastis, eucalyptus, Prussian blue (90 grain doses), chloride of sodium (1 ounce doses), nitre (15 grains), sulphites (2 drachm doses), chloride of ammonium (2 drachms), piperine, ergotine, iodide of potassium, bromides, nitric acid, iodine (free), phosphorus, strychnine, quassia (in large doses), resorcin, and about as many more drugs have been from time to time expected to share the success of quinine—they are seldom used.

Warburg's tincture possesses powerful diaphoretic and antiperiodic properties, and is highly praised by Maclean. (See author's *Manual of Materia Medica and Therapeutics*, 5th edition, page 620.)

Quinine possesses also great *prophylactic* power, and 5 or 8 grains daily will generally be found to afford protection in bad malarious districts.

The after consequences of ague or the malarial cachexia will be best treated by removal from the malarious district, and the steady administration of quinine, arsenic, and iron. Maclean strongly recommends a sea voyage, and a sojourn at the baths of Carlsbad or Homburg. The enlarged spleen gives way to large doses of quinine and iodide of potassium, and to local applications of biniodide of mercury ointment, or of lin. potass. iod. cum sapone, B. P.

INTERTRIGO

The treatment applicable to acute eczema (page 226) will speedily remedy this affection. As it occurs about the flexures of joints, or where overhanging or overlapping folds of integument are permitted to remain in contact, it will generally be necessary to separate the opposing surfaces by a fold of lint or absorbent wool smeared over with zinc ointment, or freely sprinkled with Fuller's earth, zinc oxide, bismuth subcarbonate, or other drying powder, to which a little finely pulverized camphor has been added. As a rule, pastes, powders, or stiff ointments are very much better than lotions. The following is a good ointment:

℞.—Unguent. zinci oxidi ℥ij.
Bismuthi subcarb. ℥ij.
Calaminæ præp. ℥ij.
Spt. camphoræ. ℥j.—M.

S.—To be used as directed.

INTESTINAL OBSTRUCTION.

No more serious problem can be presented to the mind of the physician than that involved in the treatment of a case of acute intestinal

obstruction. Year by year operative measures are becoming more generally recognized as an early indication instead of being regarded in the light of a *dernier ressort*, as has been the case in the past. Already there are not wanting signs that the pendulum has swung too far in this direction, some authorities recommending an immediate resort to laparotomy without waiting for any trial of the older therapeutic agents. The natural tendency, doubtless, is to wait too long before resorting to abdominal section, and hence it is perhaps an advantage that the earliest adoption of operative measures should be put in the most forcible light possible. The natural reluctance to such a serious undertaking will probably always prevent the operation being performed before opium, enemata, etc., have obtained a trial, though these measures probably will cease to be pushed so far to render operative interference too late.

The first step in arriving at a conclusion regarding the best treatment is to make as accurate a diagnosis of the *cause* of the obstruction as the difficult unravelling of the tangled web of the symptoms will permit. In those cases where a positive diagnosis is possible, the difficulty of deciding upon the most appropriate treatment is not great. No decision for or against operation should be arrived at until the physician has exhausted every means of coming to a conclusion as to the case being one of volvulus, intussusception, strangulation by bands or apertures, etc., stricture, fecal accumulations, or tumors. Unfortunately it is not within the scope of the present volume to discuss the various symptoms which enable the physician or surgeon to differentiate these various causes of intestinal obstruction.

In the great majority of cases it is impossible to arrive at any conclusion until the symptoms have been watched for a short time; indeed, it is impossible to be certain that the case is one of obstruction until a certain time has passed over. During this period the lines of treatment are clear. Absolute rest in the horizontal position in bed with the knees drawn up as the patient lies upon his back is the easiest position, and the one naturally assumed during the later stages. As vomiting is an early symptom, little nourishment can be retained, and efforts at forcing it into the stomach are worse than useless.

Frozen milk would be the best possible dietary under such circumstances, but it is seldom convenient. Small pieces of ice frequently sucked or swallowed, and an occasional teaspoonful of Brand's beef jelly, is the most that should be attempted.

Opium is of the greatest service, and is to be given in proportion to the amount of pain present. There is, however, one serious objection to it, but which, nevertheless, cannot be permitted to forbid its use—*i. e.*, it tends to mask the symptoms, and may mislead. The experienced physician will constantly have to make allowance for this, and have it ever before his mind in weighing the serious issues as the case advances. The opium should be given as the case may indicate. Thus in violent, sudden pain, soon followed by vomiting, the hypodermic injection of

$\frac{1}{4}$ grain of morphine, or an enema containing 45 minims of laudanum, should be given. As a rule, solid opium, or the powdered preparation made into pills, should not be administered, owing to the retardation of absorption.

Thirty minims of solution of morphine (1 : 100) with 1 minim of atropine solution (1 : 100) can be safely given by the mouth, and half these quantities may be repeated every two, three, or four hours, as the pain and collapse warrant.

Chloroform or ether should not be employed at this stage, as the vomiting which often follows their inhalation may seriously mislead the physician, and aggravate the patient's suffering.

Hot poultices of linseed meal, or cold compresses or ice bags, according to the patient's sensations of comfort, may be applied over the entire abdominal surface. Bryant lays great stress upon the value of belladonna externally as a means of quieting peristalsis. He also gives the drug internally by the mouth or as a suppository, and prefers it to opium. He records some interesting successes recently from treatment which might be thus summed up: The recumbent position, with elevation of the pelvis, so as to allow gravity to act toward the thorax, starvation, rectal feeding, belladonna and glycerin externally, and belladonna and opium internally.

If a purgative has not already been administered, which is too frequently the case, the physician should not only abstain from prescribing it, but he should warn the patient and his friends of the danger of attempting to have the bowels moved by this means. Even when the case is strongly suspected to be one arising from fecal accumulation, purgation is fraught with very considerable danger at this stage of the obstruction.

Enemata may, however, be administered with comparative safety and considerable advantage. To do so to best advantage requires attention to several important details: The patient should be turned over upon his left side, the shoulders should be lowered, and a hard pillow or cushion placed under the pelvis, so as to favor the gravitation of the fluid along the colon.

The syphon apparatus is preferable to the India-rubber suction or the old-fashioned piston appliance. Should these latter be employed, the greatest gentleness and patience must be exercised, so as to prevent premature reflex contractions of the colon or rectum. Tepid water alone, without soap, castor oil, turpentine, soda, or other irritant, is the best—the object being to throw up as much liquid as possible without causing its return by stimulating the bowel. This may be assisted in some cases by turning over the patient upon his back, and afterward upon his right side, so as to assist the passage of the fluid toward the ileo-cæcal valve. At a later stage this object may be favored by the abdominal taxis.

The administration of the enema should not be intrusted to any other hands, but should be carried out by the attendant himself. By pausing

occasionally during the operation (without removing the tube) until the temporary spasm of the bowel subsides, large quantities of fluid may be introduced.

The writer believes that the use of O'Beirne's long tube is a serious mistake; he has never seen any advantage from it, but, on the contrary, he has witnessed mischievous irritation produced by its use. The enema may afford considerable relief by ridding the colon of its contents; it may dislodge an impaction, unfold a twist, or even remedy an invagination. It is also, in some cases, of great value in clearing up a diagnosis, and if given with the care just now recommended is very unlikely to do any mischief.

When the symptoms of acute obstruction show no signs of yielding to starvation, rest, opium, local applications, and copious enemata, there are still other measures worthy of trial before resorting to laparotomy. Where the case is suspected to be one caused by the strangulation from a band, volvulus, or invagination, the next procedure may be followed by success.

Abdominal taxis, to be carried out to its fullest extent, should be only attempted after the administration of chloroform or ether. The patient lying upon his back, the surgeon should massage or knead the abdominal contents with considerable force applied by both hands, until every region has undergone thorough manipulation. Then the body may be inverted, and when in this position, with the feet uppermost and the head down, it may be shaken, as Hutchinson recommends, up and down. Afterward the patient may be turned back upward, and his body shaken backward and forward, and to and fro. Enemata are recommended to be administered when the body is completely held in the inverted position by strong assistants, and their use in this manner may be regarded as a part of the abdominal taxis. By these means there is some hope that a loop of intestine may be untwisted, or a coil pulled out of an aperture, or an invaginated portion unfolded, or a knuckle withdrawn from under the constriction of a band. If the abdominal taxis is carried out in the above thorough manner, it is only admissible in the *early* stages, and its repetition is useless or dangerous later on. The distended loop, the seat of volvulus, or of constriction by a band, may be fearlessly tapped by a fine trochar and canula thrust through the abdominal wall. The spontaneous reduction of the strangulated coil has been known to follow the withdrawal of the gas. It is not admissible, however, where there is reason to believe that the coats of the bowel are seriously diseased or inflamed. Where intussusception is believed to be present, and copious warm water enemata have been tried in vain, the bowel may be distended by pumping in air through the rectum by means of a pair of bellows, a Higginson's syringe, or an instrument devised for this purpose. Sulphuretted hydrogen or pure hydrogen has been similarly used.

Carbonic acid gas has been successfully employed in some cases. It can be generated in the bowel by injecting a solution of bicarbonate

of soda, followed by a solution of tartaric acid; or syphons of the gas may be used conveniently. The inflation of the bowel by bellows is more satisfactory, as the amount of air required may be measured, to a certain extent, by the resistance and by the tension of the walls of the abdomen. Many cases have been cured by these means, but the practice is not without serious danger, as the pressure may, especially in infants, cause rupiure of the bowel, and there is some likelihood of the intussusception being only partially relieved or reduced, in which case the symptoms return with intensity after a temporary amelioration.

Inflation is not only useless, but is distinctly contra-indicated where the invagination is of long standing, or where there is evidence of acute general peritonitis, gangrene, or adhesions.

Metallic mercury has been administered. The writer knew of one case of obstruction from intussusception where more than three pounds avoirdupois of the liquid metal was administered by pouring it through a funnel and tube into the stomach. Though the obstruction was relieved, the patient died several weeks afterward from what was supposed to be the result of an indiscretion in diet. It is not, however, a method to be recommended, being very liable to destroy the bowel, or cause serious trouble by its retention afterward. It has, however, been employed occasionally in fecal obstruction successfully.

Nothnagel still recommends the use of metallic mercury as harmless in recent cases.

Where a very large impacted gall-stone causes symptoms of acute obstruction from blocking up of the small intestine, rest, opium, and abdominal massage have been followed in several cases with success.

The application of a strong interrupted current to the abdominal walls has been known to remove symptoms of acute obstruction, and some physicians recommend the introduction of one pole into the rectum. The best method of using electricity for this purpose is to use a strong continuous current. Boudet makes a solution of salt injected into the rectum to act as one electrode. He passes a current of 40 milliampères for five minutes, after which he reverses it and interrupts it every twenty seconds. Excellent results are reported after this treatment.

Washing out of the stomach may give considerable relief, and may be resorted to pending the completion of arrangements for a more serious operative interference. It is indicated where the vomiting is distinctly stercoraceous and is always palliative, and may possibly be curative. Rectal feeding, by nutritious or peptonized enemata, may be called for where vomiting is incessant and collapse well marked.

Where success does not immediately follow the employment of the various measures already described, the operation of laparotomy should be decided upon without further delay. The writer can recall vividly many cases in his own experience where the post-mortem revelations, or the knowledge acquired in later years, would justify him in saying

that had laparotomy been performed it would have probably saved life. The practice of opening the abdomen in such cases dates back from a comparatively recent period, yet innumerable lives have been saved from it during the last ten or twelve years. The high mortality is sure to yield when, by common consent, the operation is undertaken at an earlier stage of the disease. Delay is dangerous, every hour increasing the chances of a fatal termination, though Dr. W. B. Richardson maintains that laparotomy need not be seriously entertained until the onset of fecal vomiting, after which it is imperative.

The abdomen should be opened in the middle line between the umbilicus and pubes. There is no advantage in making a very free incision, as the object of the surgeon is to prevent the protrusion of the intestines. A wound sufficiently large to admit the entire hand is generally more satisfactory than a larger one. In the case of intussusception in children, it may be well to attempt exploration through an incision large enough to freely admit two fingers. Further extension of the opening can be easily made afterward, if necessary.

In those cases where laparotomy is undertaken for obstruction which a previous herniotomy has not relieved, or where the case is complicated by the presence of an old hernial sac or scrotal tumor of doubtful contents, it is, notwithstanding the advice of eminent authorities, better to make a fresh median incision than to cut down upon the neck of the tumor, or prolong inguinal incisions previously made. The writer has assisted at four operations where abdominal incisions were extended from the region of Poupart's ligament or the inguinal canal, and the subsequent steps were most seriously complicated thereby. The median incision would have saved life in one of these cases.

Greig-Smith lays great stress upon the dangers and disadvantages of anæsthetics in operating for abdominal obstruction. He states that the anæsthetic increases shock where such increase can ill be borne, and that it has a special risk of its own as tending to induce vomiting, which may suffocate the patient. The distended stomach should be emptied by passing the stomach-tube before anæsthesia is begun, or, at least, before it is complete. The anæsthesia should be continued no longer than is necessary to make the parietal incision and place the sutures ready for tieing—that is to say, from three to five minutes. All further manipulations may be carried out without pain to the patient while he is recovering from the anæsthetic. It is wonderful how little these patients feel and how quietly they will lie and languidly watch the proceedings being carried out for their salvation.

The abdomen being opened under antiseptic precautions, and the intestines prevented from protrusion by the application of warmed aseptic sponges or flannel cloths, the surgeon should insert his hand and make in a bee-line for the ileo-cæcal valve. Should there be much difficulty in doing so, the distended coils of intestine may be freely punctured with a fine trochar, though it is often surprising to find in some cases how little additional room is gained by this proce-

dure. The cæcum being found in a distended condition, the surgeon knows that he will come upon an obstruction in the large intestine by following the course of the bowel from the valve toward the rectum. Where there is any great difficulty in doing this he may begin anew at the upper part of the rectum, and proceed upward in the direction of the transverse colon and valve, pursuing his exploration methodically and leisurely until he arrives at the seat of the obstruction. Upon the same principle the small intestines are to be explored, passing each portion rapidly through his fingers. If a band or diverticulum is found to be the cause of the strangulation it is to be divided and the imprisoned coil or knuckle of bowel set free, an internal hernia may be reduced and an intussusception drawn out by pulling gently upon the upper part and squeezing or kneading the lower portion from below upward. Where reduction of the invagination is found to be impossible, enterectomy should be performed, and this is also applicable where gangrene has supervened. When the obstruction cannot be discovered, the most prominent coil of distended bowel should be sutured to the abdominal wound, and an artificial anus then produced.

Obstructions caused by gall-stones or foreign bodies are to be dealt with by incising the bowel, and suturing the wound with catgut and returing it.

Strictures are best treated by enterectomy, and when situated in the large intestine must be met by colotomy or colectomy.

Volvulus of the sigmoid flexure may be best treated by performing a left lumbar colotomy. When failure attends *all* other means of relieving fæcal accumulations, colotomy may be entertained as a means of giving relief. This should, however, be avoided until the prolonged use of copious enemata, cautious attempts at purgation, and the supervention of urgent symptoms, prove that further delay is useless.

The treatment of the chronic forms of intestinal obstruction, or of the acute forms supervening upon the chronic, is to be carried out upon the same general principles as those already mentioned. Preventive or palliative treatment by judicious dieting must not be forgotten, and the physician should not be tempted to postpone laparotomy until the supervention of perforation or general peritonitis renders its success almost hopeless. Nélaton's operation or enterotomy, whereby an artificial anus may be established in the small intestine, is indicated in those cases where the seat of obstruction is beyond reach. It may be performed by making an incision above Poupart's ligament upon the right side. After entering the abdominal cavity, the first coil of distended bowel presenting in the wound is sutured to the margins of the skin incision by a double row of sutures, after which the bowel is freely opened between the sutures.

Greig-Smith, in speaking of those cases where there is great difficulty in finding the cause or seat of the obstruction, says: "I think it wiser

at once to perform enterostomy than to spend much time groping about for the cause of the obstruction. The fact that enterostomy or abdominal drainage will, even if the cause of the obstruction has not been touched, rescue a patient from death, is sufficiently well established to want no emphasizing from me."

The after-treatment is to be carried out upon general principles as in the case of herniotomy.

INTESTINAL HEMORRHAGE—See Melæna.

INTESTINAL INFLAMMATION—See Enteritis.

INTUSSUSCEPTION—See Intestinal Obstruction.

IRITIS.

The first thing to do is to administer a smart saline purge, and drop into the eye a few drops of solution of sulphate of atropine (1 : 100). Should pain be a severe and prominent symptom, cocaine should also be freely used. A drop or two of a 4 per cent. solution may be instilled, or a cocaine disc may be inserted behind the lid every two or three hours, or hypodermic injections of morphine may be required. When there is much congestion, three or four leeches applied to the margin of the orbit or temple give great relief. As a rule, if wide and uniform dilatation follows the use of atropine, the case will soon yield. If there be much plastic exudation, and the atropine fails to enlarge the pupil widely, it must be pushed every three or four hours with the view of dragging upon the adhesions. Mercury should be freely given in all cases where this result is not speedily obtained. In syphilitic cases the action of the mercury must be kept up until there is evidence that the constitutional effects of the drug have been produced, after which the dose may be diminished. Salivation is seldom necessary, and should be avoided. Mercury is essential in all cases of iritis with much exudation of lymph, but in non-specific cases its action may be suspended as soon as this disappears. The influence of atropine should be maintained until it is clear that the danger of adhesions has passed away.

In serous iritis, and sometimes in the plastic variety, it may be found necessary to tap the anterior chamber by inserting a fine cataract-knife into it in front of the iris, and this may be repeated if the fluid accumulates again.

With a distinct rheumatic history, salicylate of soda may be given in full doses, also where mercury is indicated, but cannot be tolerated.

Turpentine in full doses internally (10 minims every four hours) has been proved to possess remarkable power in causing absorption of exudations. Duboisine, pilocarpine, colchicine, homatropine, and physostigmine have been recommended, but the general management

of a case of ordinary iritis may be summed up in the words—rest, atropine, and mercury.

When the rapid increase of the plastic exudation threatens to close up the pupil, it may be necessary to speedily produce the constitutional effects of mercury by inunction in severe cases.

Good results have been obtained by injecting about $\frac{1}{3}$ grain of calomel, suspended in glycerin or weak mucilage, into the tissues in the neighborhood of the margin of the orbit.

The treatment of suppurative iritis and of irido-choroiditis is to be carried out upon the same lines as in severe iritis, the severe pain being relieved by cocaine and morphine hypodermically.

Sympathetic iritis must be promptly met by enucleation of the primarily affected eye and the frequent instillation of a weak sublimate solution into the secondarily affected eye.

Where, in spite of atropine and mercury, or where the case has been negleted from the first, and adhesions have formed which refuse to yield to atropine, they should be treated by operative measures as soon as it is clear that they are the cause of secondary attacks of iritis. Their destruction may be accomplished by inserting a minute hook through an opening in the cornea and lacerating the adhesions by traction, or the operation of iridectomy may be performed.

ITCH—See Scabies.

JAUNDICE.

The treatment of jaundice cannot properly be detailed here. It is but a symptom of a large number of totally distinct affections, and the most appropriate management of these will be given under their separate headings. (See Gall-stones, etc.) For the jaundice itself there cannot be said to be any specific treatment; but there are, fortunately, remedial agents of value which may be palliative, even when the cause of the jaundice is irremovable, as in cancer, tumors, impacted calculi, etc. The first object of the physician, then, is to treat the cause. This is very often, for example, owing to a catarrhal condition of the stomach, the inflammation creeping from the gastric mucous membrane into the duodenum and up the bile duct. As already described, this condition soon yields to appropriate remedies, such as mild purgatives, judicious diet, bismuth and alkalies, with *minute* doses of morphine and counter-irritation.

There is in a large proportion of cases of jaundice no discoverable cause, as remarked by Fagge, who applies the term "simple" jaundice to such, and the question arises, Is there any safe efficacious treatment applicable in these instances? Any attempt to treat a symptom of this complex kind, about whose pathology there is so much uncertainty, is open to the imputation of quackery, and, as Duckworth has put it, "the recommendations of any drug for the treatment of a symptom depending upon so many possible causes can hardly receive serious

attention unless a full diagnosis of the cases has been established." Where, however, a full diagnosis is impossible, and where upon no other grounds than mere empiricism a certain drug has been used and found by some observers to produce good results, there can be no valid reason why it should not receive serious attention, especially if it be free from the objection of being dangerous and harmful. The most that can be said in these cases is that such good results are open to question, especially as it is known that these examples of jaundice are very likely to end in spontaneous recovery.

Of remedies of this class the common ragweed (senecio jacobœa), recommended by the late Dr. Charles Purdon, is a typical example. He found that teaspoonful doses of fluid extract (1 : 1) had a marked influence in dissipating the jaundice.

Vichy and Carlsbad waters on the Continent, podophyllin, euonymin, and iridin in small doses in America, and alkaline soda, potash, ammonia salts at home have long been maintained to exert decidedly beneficial action in simple jaundice. The following combination is often prescribed:

℞.—Sodii bicarb. ℥jss.
Pulv. rhei ℥ij
Pulv. zingiberis ℥iv.
Pulv. calumbæ ℥vj.
Pulv. ipecacuanhæ et opii ℥j.—M.

S.—A small teaspoonful in half a tumblerful of patash water, to be taken every four or six hours.

The following liquid preparation may be used:

℞.—Ext. taraxaci fld. ℥ij.
Sodii bicarb. ℥vj.
Tinct. rhei ℥jss.
Infus. gentianæ ad ℥xij.—M.

S.—A tablespoonful to be taken three times a day.

Where alkaline agents are not admissible, benefit may be derived from the favorite acid remedy—dilute nitro-hydrochloric. This may be given in doses of 20 minims, well diluted with a weak, bitter infusion, three times a day, before meals, and 25 grains of the chloride of ammonium may be given at bed-time in warm whey. The diluted acid may be also applied locally, or used as a bath.

Calomel and other mercurials should not be employed in simple jaundice, except as occasional purgatives, when they may be followed by a morning draught of Friedrichshall water, sulphate of magnesia, sulphates of potash or soda, phosphate of soda, or Carlsbad salt. Enemata of cold or tepid water may be employed daily.

The value of pilocarpine will be presently referred to. Quinine and arsenic may be found useful in cases of malarial jaundice.

The diet should be as simple as possible. A skim-milk diet the writer believes to be the best in such cases. Sugar, fats, and alcoholic stimulants should be avoided. Butchers' meat is best given in the form of beef-tea. Rice and other farinaceous foods may be allowed. Hot baths and hydropathy, as will be mentioned, are valuable aids to treatment.

There may be legitimate doubts expressed about the value of the above-named remedies in dissipating simple jaundice. They possess one advantage, however—that, used as recommended, they can do no harm.

Where the symptoms indicate the presence of gall-stones, the various measures mentioned upon page 268 should be pressed into the service, and when the obstruction is complete, operative interference may be the only remedy available.

When permanent jaundice has been established, or where there is evidence that the icterus is dependent upon obstruction, the most that can be done is to assist Nature in her efforts to eliminate the re-absorbed bile. There can be no question that substances capable of exerting a marked effect upon the liver or duodenum, as full doses of calomel, podophyllin, soda salts, or euonymin, are distinctly contra-indicated in these cases. Purgatives are required, but only such as exert no well-marked hepatic action should be selected. Salines are the best, and they may be preceded by aloes or other cathartic of the same class.

In this way the natural purgative effect of the bile, which in the normal condition flows into the intestines, may be kept up, and portal congestion at the same time will be diminished.

The bile, however, exercises important functions in health, assisting the absorption of fats, and preventing fermentative and putrefactive changes occurring in the intestinal contents. It is, therefore, advisable to supply a substitute as near as possible to the natural fluid in chemical constitution. In the official fel bovis purificatum this is obtained. It is, however, so seldom employed that, when ordered by the physician an old, effete sample is likely to be supplied by the chemist. Ten grains of the fresh preparation, in pills, may be administered three or four times a day.

Where the absence of the natural bile has led to diarrhœa, resulting from the irritation of decomposed or putrefying intestinal products, the best thing to do is to administer an intestinal disinfectant. The best is turpentine, given in large doses, in the form of a capsule, which, if swallowed when the stomach is quite empty, may be found to pass directly through into the intestines, where it will exert its antiseptic properties to best advantage. Creasote may be given in the same way, or charcoal, also in the form of capsule. Naphthalin, boric acid, or other antiseptic may be employed.

As the bile is chiefly eliminated by the kidneys in obstructed jaundice, diuretics, as copious draughts of warm liquids, or even members

of the stimulating diuretic class, as broom, digitalis, iodides, etc., may be employed with much advantage. The skin should be kept in the best condition by wearing warm clothing, and resorting to the warm, hot, or Turkish bath, or by using a hot or wet pack every evening.

There is one very important drug which may be used with much advantage in jaundice from obstruction. It relieves the distressing itching of the skin after warm alkaline baths have failed. Pilocarpine, administered hypodermically, in doses of about $\frac{1}{4}$ grain, relieves this distressing symptom for twenty-four or thirty six hours; it is, in fact, the only remedy for this purpose on which much reliance need be placed. Most glowing reports come from Witkowski, who claims that injections of $\frac{1}{6}$ grain, once or twice a day, will act as a specific for all cases of simple hepatogenous jaundice. It is even affirmed that, where speedy disappearance of the icterus does not occur, that it may be taken as strong evidence that the disease is cancer of the liver, and not simple jaundice. It is, however, certain that this is too strongly stated as obstructive jaundice, not depending upon cancer, has been seen to resist pilocarpine. There cannot be any doubt, however, that in this drug we possess the most useful remedy yet known in the treatment of simple or obstructed jaundice, and it will be worth trial in all cases where the diagnosis is doubtful, and it may be employed in conjunction with any other form of treatment.

Excellent results have been from time to time reported of Gerhardt's method of treating all cases of catarrhal jaundice in children and adults. It may be useful in the obstruction caused by small calculi, and is carried out by passing a smart faradic current through the gall-bladder, by placing one pole over the spine and the other over the distended organ, so as to produce brisk contraction of the muscular fibres of the gall-bladder.

The treatment of infantile jaundice is most unsatisfactory. The ordinary icteroid tinge appearing upon the skin of children a few days after birth is, however, hardly worth mentioning. It is probably caused by the habit of half-smothering up all newborn infants in flannels. It rapidly disappears upon the administration of a purgative, and a liberal supply of fresh air.

In cases where jaundice supervenes before birth, or comes on with deep conjunctival staining soon afterward, no remedy appears to stop the commonly fatal issue. The writer has seen an instance where about ten infants of one healthy mother perished in this way. He did not try pilocarpine in any of the cases, as its action was then unknown, but it would not likely have been efficacious, as in one instance there was congenital absence of the gall-bladder, though in a subsequent birth there was no malformation, though the infant died twenty-four hours after being born deeply jaundiced.

JOINT DISEASE.

In detailing the treatment of hip-joint disease, the principles which should guide the surgeon have been enumerated. They may be briefly

stated in a general way as applicable to the treatment of most joint affections. Inflammation of the synovial membrane will be mentioned under Synovitis.

The first look-out in dealing with a case of chronic joint affection (articular ostitis) in its earliest stages, is to improve the standard of health in every way possible, by pure air, good food, healthy surroundings, and the use of constitutional aids to improve nutrition, as cod-liver oil, malt extract, and peptonized foods, etc. Where any general tendency to struma, syphilis, rheumatism, or other blood condition prevails, appropriate remedies should be exhibited. In all cases, iron, iodides, arsenic, phosphates, quinine, and other tonics, should be given in the early stage of the affection.

Rest is essential, it should be as thorough as circumstances will permit. *Absolute* rest of the affected joint must be aimed at, though it will not be often attained. It may be attempted in various ways if the joint be a large one—hip, knee, or ankle—the patient should be confined to bed until the acute symptoms pass off, after which locomotion may be permitted, when immobility has been secured by means of proper splints or unyielding encasements. This rest must be pushed until all heat, redness, and pain disappear. The mistake of keeping a joint too long in a state of absolute repost is a serious one. Ankylosis may result, and this termination, though undesirable, and to a certain extent unsatisfactory, is one that the surgeon may be glad to hope for in bad cases. The limb, therefore, should be placed at the very start in such a position that, should ankylosis occur, the subsequent usefulness of the joint will be the least interfered with.

Where pain is prominent, and does not yield to rest, warm fomentations, hot poultices, cold compresses, evaporating lotions, Leiter's tubes, or ice may be employed, the selection depending chiefly upon the patient's sensations of relief as either application is made. As a routine method, nothing surpasses the old-fashioned method of soaking narrow strips of lint in spirit lotion (spt. vini rect. 1 and water 2), enveloping the joint with them, and covering all over with a layer of oiled silk, gutta-percha tissue, or thin mackintosh. It is applicable to the most acute acute and to the most chronic cases where pain is prominent.

Where there is much throbbing pain and congestion the application of leeches gives much relief. Like cold, leeching is contra-indicated in very chronic cases, except when the patient is suffering acute pain from the supervention of active mischief in a joint long affected with articular trouble.

Extension by means of weights and a pulley, as described under hip-joint disease, or by means of suitable splints in the case of other joints, is a valuable means of diminishing inter-articular pressure, though it doubtless exercises beneficial action in other ways.

When the more acute symptoms have been thus combated, and all pain has disappeared for a time, passive motion may be carefully com-

menced, the surgeon feeling his way cautiously. Many joints have been hopelessly destroyed by rest prolonged long after the inflammatory action had subsided. It is this mistake which enables the unscrupulous bone setter to thrive. Getting a chronic joint affection in which all inflammatory action has long ceased, owing to treatment by some surgeon whose timidity prevents him beginning passive or forcible movements, the bone-setter pronounces the limb to be "out of joint," and, after a few forcible movements, he assures the patient that he has "put in" the joint, and the mobility and painlessness of the limb which follow apparently corroborate his statements. When the value of early massage and movements of a passive or forcible nature are universally appreciated, the principal occupation of the bone-setter will be gone.

When there is much thickening from exuded inflammatory products outside the joint, or effusion into the synovial sac, pressure by neatly applied strapping or Scott's dressing is of much use. A Martin's elastic bandage or massage may succeed when these fail to cause absorption.

Abscesses should be freely opened as soon as the physical signs clearly point to the presence of pus. Where deep-seated pain, limited to a very small area, has been continuous for a considerable period, the surgeon need not wait for pointing, but may cut down upon the spot and remove any piece of dead or suspicious bone by a small gouge. Trephining may be resorted to in some cases with excellent results, where the localized mischief can be reached without opening the joint. Sinuses may be divided and scraped and afterward swabbed with strong solution of chloride of zinc, and the small cavities of necrosed bone may be touched with strong sulphuric acid.

When it is evident that the joint has become disorganized it may be freely incised and washed out with an antiseptic solution, free drainage being provided by the introduction of moderately-sized tubes. This is a fairly satisfactory operation in cases of simple suppuration of a large or small joint, but it gives very poor results in chronic articular ostitis. The method of opening and thoroughly scraping out the interior of the joint, by which every scrap of diseased tissue is thereby removed, is in many respects to be preferred to excision. This operation, known under the names of arthrectomy or erasion of a joint, is certain to materially alter the future of excision. It is not applicable to the hip articulation owing to its shape and structure, but in the knee excellent results may be anticipated from this modification of conservative surgery. (See under Knee-joint Disease.)

Where erasion is not suitable—*i. e.*, in those chronic joint affections where the mischief extends for some distance into the ends of the bones entering into the joint, a modified excision or a combination of erasion and excision may be tried. When these means are not admissible, owing to the extensiveness of the disease there is no resource left but to amputate.

The new treatment recommended by Koch for the treatment of joint disease depending upon tuberculosis will be found detailed under the article Tuberculosis, and Lannelongue's new method of attacking the bacilli by deep injections of chloride of zinc will also be found there.

For the methods of Billroth and Bruns of treating chronic suppurating joints by the injection of iodoform see under Abscess, page 15.

JOINTS, Inflammation of—See Synovitis.

KELOID.

Two distinct affections are embraced under this name. Unfortunately for the present purpose, the confusion is of little moment, since each is almost equally beyond the range of remedial measures, though both may spontaneously resolve and disappear.

Extirpation of the hardened patches or tumors is generally followed by return in a more active form. Where the affected part can be covered with an unirritating plaster, as the emp. adhesivum, or emp. hydrargyri, and protected from all sources of irritation or annoyance, the best results are obtained. Pressure by an elastic bandage, where the situation of the growth permits, gives best results.

Electricity, electrolysis, iodides, mercury, arsenic, chloride of gold, and other remedies used with the view of promoting absorption, are useless. Caustics in rare cases have been followed by improvement, but far more frequently by an increase of the growth. The pain and uneasiness which often attend the affection must be met by appropriate remedies. Anodynes like opium, analgesics like antipyrine, cocaine, exalgine, or large doses of bromides may be called for.

KERATITIS—See under Cornea (page 150).

KIDNEY DISEASES—See under Bright's Disease and under Movable Kidney.

KNEE-JOINT DISEASE

Under Synovitis the main points indicating the treatment of the inflammation of the synovial membrane of the knee will be found. Under Hip joint Disease (page 364) and under Joint Disease (page 428) will be found the chief measures applicable to chronic articular ostitis. These may be briefly repeated. They are indicated in all cases of disease involving the cartilages or ends of the bones entering into any articulations in the body. As chronic disease of the knee-joint so frequently has its origin in struma, constitutional remedies are of vital importance. Fresh air, free ventilation, seaside resorts, good food, warm clothing, massage, and every possible measure calculated to improve nutrition and raise the standard of health should be attended to. The drugs to be depended upon in such cases may be mentioned in their order of merit—cod-liver oil, iodide of iron, malt extracts,

hypophosphites, bichloride of mercury in very minute doses, arsenic, and chloride of calcium.

Local measures, as already mentioned, will embrace absolute rest by means of splints or extension. While active mischief is present the entire limb should be rendered immovable. Pain is to be met by cold or warm applications, counter-irritation by means of blisters or the cautery iron, leeching, or anodyne liniments or lotions. As the more active symptoms subside, it is of the very greatest moment that the patient should be rescued from the atmosphere of his bedroom, and tempted to spend as large a portion of the day as possible in the open air. By means of a plaster-of-Paris casing or a leather splint this may be managed without much danger, but the application of a neatly-fitting Thomas's splint is much better. When it is in use the joint is open to daily inspection or to the convenient application of local remedies, as iodine liniment, lin. potas. iod. cum sapone, B. P., spirit or other lotion. By a raised boot and crutches the patient can freely move about without running much risk, and pain may disappear.

Strapping over mercurial dressing may be applied at a later date, or the pressure of a Martin's elastic bandage may be tried.

Abscesses should be freely opened ; and if a continuous localized pain over a spot in the head of the tibia, or over either condyle of the femur, should lead the surgeon to suspect a localized abscess in the cancellous tissue, trephining may be seriously contemplated where this is rendered possible without opening into the joint.

When, however, in spite of all these measures, matters go from bad to worse, and the joint becomes hopelessly disorganized, several procedures are available. The most valuable are :

1. Arthrotomy may be performed—*i. e.*, the joint may be incised, washed out, and drained.

2. The joint may be incised, and lint saturated in a mixture of strong sulphuric acid (1 part) and water (2 parts) may be inserted, after washing out with an antiseptic lotion. By this means, pulpy synovial growths may be dissolved. The method is useless unless where the disease is confined to the synovial lining of the joint, and at the best it is most tedious, and very often ends in failure. Occasionally, however, a firm ankylosis results.

3. A lateral incision may be made upon each side of the patella, and the pulpy diseased membrane may be scraped away with a Volkmann's spoon. This is seldom successful, as it is impossible to remove more than a comparatively small portion of the diseased tissue, and in the typically strumous joint the removal of every portion of the affected tissues is essential.

4. These two methods may be combined. After lateral incisions have been made, and as much of the diseased membrane as possible has been removed by Volkmann's spoon, sulphuric acid may be freely and repeatedly used with the view of causing destruction of the remainder. Though the joint may be left in a better condition for the subsequent

establishment of ankylosis than if either procedure alone had been employed, nevertheless the same objections remain, and another is superadded in the danger of destroying healthy tissue unnecessarily.

5. The operation of arthrectomy or erasion may be performed. This is really method No. 3 systematized and carried out to its very fullest extent, It has been advocated and performed with decided success by Wright and Edmund Owen, who agree in stating that in suitable cases of diseased knee-joint it is better surgery than excision. Owen's paper in the *Transactions of the Medico Chirurgical Society*, vol. lxxii , is a valuable addition to the surgery of the knee-joint. The operation is not applicable to the same extent in the treatment of other large joints. It is based upon the theory of the infective or invading nature of the microörganisms supposed to be always present in chronic joint disease, and upon whose presence in some small fringe or crevice of the diseased membrane which escapes removal in other operations, failure depends. Its great advantage over excision lies in the fact that it is essentially a conservative operation in that it does not remove any healthy tissue, while, at the same time, it is an extremely radical one in that it insures the taking away of all material of a dangerous or suspicious nature. It is, like all measures short of amputation, contraindicated by the presence of extensive disease of the articular ends of the bone. Ankylosis generally results, but a good limb may result with moderately free movement—a result midway between that obtained from incision and excision.

The following is Owen's description of the operation: "The operation is commenced by making a bold horse-shoe incision from the tuberosity of one femoral condyle nearly to the tubercle of the tibia and up to the other tuberosity of the femur. The incision opens the joint and divides the ligament of the patella. Bleeding vessels are caught by the self-holding forceps. The crescentic flap with the patella is then turned up, and if the subcrural pouch of the articular cavity is not thereon fully exposed, the horns of the incision may be prolonged upward to the necessary extent. Every ulcerated surface of articular cartilage or bone is then scraped over or scraped out, all pellets and fringes of the synovial membrane are sliced off with curved scissors or scalpel, the semilunar cartilages are taken away, and the crucial ligaments are dissected out. The end of the femur is then trust out of the wound, and the posterior surface of its condyles, and the synovial recesses above them, and the posterior part of the capsule of the joint, are thoroughly scraped. (When scraping the front of Winslow's ligament the azygos artery is likely to be wounded and to bleed somewhat vigorously.) The subcrural pouch is then thoroughly explored and scraped, the articular surface of the patella is also scraped, and if it be much affected it may be sliced off, but the bone should be taken away.

"When, to the entire satisfaction of the surgeon and his assistant, every suspicious area has been efficiently dealt with, the large cavity is

thoroughly washed out with a hot solution of chloride of zinc or carbolic acid.

"If the head of the tibia has been long displaced on to the outer femoral condyle, and the scraping which its inner tuberosity has received, does not suffice to allow of the leg being adjusted in a perfectly straight line—and this often happens—the articular surface of the inner femoral condyle must be sliced away until the desired position is attainable. Certainly the bones must not be allowed to become ankylosed with a valgous inclination.

"Provision is then to be made for efficient drainage. Upon this much of the ultimate success of the operation depends; and as the cornua of the wound cannot be depended upon for draining the post-condylar recesses, I am in the habit of boring a hole from inside the joint through the ligament of Winslow, using a pair of scissors for the purpose. The position of the popliteal artery having been made out, the index-finger of the left hand is lodged in the hollow along the inner side of the biceps tendon, and the skin is traversed at that spot. Occasionally I have drained through the space between the artery and the inner hamstrings. It matters not where the drain is so long as it is efficient. Pus cannot drain uphill. If the tube be passed from the anterior and through the posterior wound, heed must be given that it is not nipped between the femur and tibia when the limb is brought straight. On the whole, it is perhaps better to drain solely by the posterior opening, closing the anterior wound entirely with the exception of its cornua. The limb is then bandaged from the foot upward, the knee being surrounded by absorbent mercuric wool, and fixed upon the straight back splint, care being taken that the heel does not press upon the pad. The less after this that the limb is disturbed the better. The drainage-tube is soon withdrawn, the wearing or starting pains have entirely ceased, and though it must be many months before the limb is serviceable, the disease is probably at an end, and convalescence is established."

6. Excision of the joint is performed by making a curved incision through the skin, extending from the posterior part of one condyle to the corresponding part of the other. After dissecting up the integument from the front of the patella, the joint is freely opened by a clean sweep through the ligamentum patellæ and lateral ligaments. A thin slice of bone is to be sawn off the lower end of the femur and the upper end of the tibia. The diseased pulpy membrane is to be removed by the knife, scissors, and scraping, the freshly sawn surfaces of bone placed in close apposition, suitable drainage provided, sutures adjusted, and the immobility of the limb insured.

The operation of excision of the knee cannot be said to have met the sanguine expectations of its earlier advocates. To insure success it must, generally speaking, in the opinion of the writer, be undertaken at a stage so early that a natural cure is still possible if the operation be deferred. (See under Hip-joint Disease, page 366.) It is contra-

indicated where there is evidence of extensive bone mischief, and in those subjects run down by prolonged exhaustive suppuration, and in most patients past the age of thirty years.

7. When there is evidence of bone disease extending a considerable way beyond the diseased joint surfaces, where the patient is past middle life or exhausted by prolonged suffering or suppuration, and where the constitutional symptoms clearly show that the system is unequal to the long demand which an arthrotomy, arthrectomy, or excision would entail, and especially where other organs are already showing signs of breaking down, the only legitimate operation will be that of an amputation through the lower third of the femur.

For Koch's method of treating diseased joints arising from tubercular disease, see under Tuberculosis, where also is detailed the still more recent method of Lannelongue, who injects chloride of zinc into the tissues surrounding the tubercular deposits. Under Abscess, upon page 15, will be found a brief description of the method of Bruns, who, after aspiration of the joint, injects a sterilized emulsion of iodoform at varions points. Bilroth's operation is a modification of the scraping method just detailed, and of the iodoform injections of Bruns.

LABOR.

The management of a case of natural labor need not be here described in detail, the student or practitioner being already quite familiar with the essential points discussed in every text-book on midwifery, regarding the relative duties of nurse and accoucheur, position of the patient, preparation of the bed, instruments to be carried, making examinations, passing the catheter, administering enemata, chloroform, bandaging, etc.

The free use of antiseptics should be emphasized, though the present tendency toward the injection of mercuric solution after every examination made during labor is unwarrantable. The attendant should thoroughly cleanse his hands, and, after the use of the nail-brush, he should dip them for a few moments into a weak sublimate solution (2 grains in 10 ounces), or carbolic lotion (1 : 50), and as a lubricant, carbolized lard or oil (1 : 20) may be employed. The golden rule should be that, the less interference and manipulation the better for the patient. When all goes well, the first duty may be to assist nature by pushing upward the swollen œdematous anterior lip of the os, which may be, in some instances, retarding the descent of the head. This is generally accomplished without difficulty, if not attempted too soon, by pushing up the congested lip with the tip of the right index-finger before a pain comes on, and keeping it above the symphysis until the pain passes off and the head descends a little. In this way progress may be accelerated by pushing the œdematous tumor over the descending vertex, assisted by gentle abdominal pressure from above.

As the head reaches the outlet and presses upon the perineum, this

structure must be protected from laceration as far as possible. Unfortunately, the means too often employed to prevent this accident may determine rupture. Strong pressure directed against the tense perineum generally aids laceration. In many cases a slight delay gives the tissues time to dilate, and this may be all that is necessary. By strong, direct pressure against the perineum, the uterine pains are increased in force and frequency, gradual natural dilatation is prevented, and laceration is more liable to occur. Hence, some authorities recommend the patient to be encouraged to cease, as far as possible, from making expulsive efforts, in order to give longer time for the natural dilatation or stretching of the part. For a similar reason, others advise direct pressure upward and backward against the head.

The mose frequently-practised manœuvre for the support of the perineum is carried out by placing the left hand against the perineum, while the fingers of the right hand are pressed against the head. In this way *extension* of the head and retardation of its descent are at the same time accomplished. Much more power over the head is obtained by pressing against the forehead or orbital margins by means of two fingers inserted into the rectum. Ritgen's manœuvre is carried out by placing four fingers of the left hand between the tip of the coccyx and anus, while the head is distending the perineum. In this spot the brow and both jaws may be felt, and by pressing, at the end of a pain, the head is prevented from receding, and may be even advanced, while the occiput is kept close to the pubic arch, and rotation is assisted.

Dr. Gaussen has recently drawn attention to another method by which the shortest fœtal diameter of the head may be made to pass through the ostium vaginæ. He aids the movement of *flexion* by traction on the occiput, with two fingers of the right hand inserted behind the symphysis, and as the head is about to clear the ostium, he renders *flexion complete* by grasping the occiput in the hollow of the right hand, and as he pulls it down from behind the pubes, the frontal part of the vertex is pushed upward and backward toward the sacrum with the thumb of the same hand.

Free lubrication of the perineum may be employed in all cases where there is threatening laceration, and where there is much rigidity an incision with the knife or scissors may be resorted to. After labor has been completed, one or two deep sutures should be inserted by means of a curved needle. For sutures to be of use, they should be employed at the time. They are unnecessary, except when the laceration is extensive, and they are useless after a delay of twenty-four or forty-eight hours. (See Perineum—Rupture of.)

After the birth of the head, the accoucheur should see that the cord be loosened if it surrounds the neck, and the perineum should be still closely watched during the exit of the shoulders, which may require both traction and rotation.

As soon as the head has cleared the ostium vaginæ and the cord has

been removed from the neck, if present, the uterus should be firmly grasped by the left hand (see page 316), applied to the surface of the abdomen, and steady, gentle pressure is to be maintained while it is felt to diminish in size as the shoulders, trunk, and lower extremities are born.

After a short pause the pressure upon the uterus may be increased, in order to hasten the expulsion of the placenta. If this does not show signs of coming away after a short delay, two ligatures may be applied to the umbilical cord, and its section with scissors accomplished midway between the ligatures so as to separate the child from the mother. Several authorities maintain that this separation should not take place until the umbilical vein has collapsed, otherwise a loss of two or three ounces of blood is suffered by the infant. Spiegelberg consequently advises that the child should not be separated from the mother until after the expulsion of the placenta, or at least not until the latter is beyond reach of the uterine pressure.

By firm pressure applied to the uterus, which should be squeezed and kneaded alternately between the thumb and four fingers of the left hand, the placenta, as a rule, is generally expelled from it without much delay. When it has been found to enter the vagina, moderate traction upon the cord soon brings it within the grasp of the right hand, when it can be easily extracted entire along with the membranes by a rotatory movement. Undue haste and anxiety in the removal of the placenta is to be avoided, as by these means irregular contraction in the uterus may be set up.

The invariable custom of the writer is to keep up the uterine contraction for a considerable time after the expulsion of the placenta, in order to guard against hemorrhage, and with this object he does not apply the binder or abdominal bandage until after the infant has been washed and dressed by the nurse. Thus an interval of nearly half an hour is left, during which the uterus may be watched, felt, and kneaded for a few moments, and all clots expelled. If the abdominal bandage and pad be immediately applied after the termination of labor, little can be known about what is going on in the uterus. It is a good rule to give a large dose of ergot after the removal of the placenta.

Post-partum hemorrhage is to be met by the remedies mentioned under Hemorrhage, page 316.

After the expiration of the first twenty-four hours, the nurse should be directed to wash out the vagina with a weak antiseptic solution. Of all the agents of this class, permanganate of potassium is the most harmless, and, therefore, the one best suited for routine use. Where septic mischief is especially feared, weak corrosive sublimate solutions should be employed; but it is better to reserve powerful remedies for special indications, and direct the nurse, as a matter of routine, in every case to inject a pint or more of a mixture of Condy's fluid and water (a large tablespoonful to one pint of tepid water) morning and

evening. It is needless to say that this injection or douche should be used when the patient lies upon her left side or back, with a bed-pan slipped under the nates. The practice of getting out of bed upon the fourth or fifth day, as followed by women of the working classes, is fraught with much danger, and it is a wise rule to confine the lying-in woman to bed for a minimum period of eight or nine days. Robust patients may be sometimes permitted to get up after seven days, and weakly patients in whom the process of involution is tardy, had better be kept in bed for fourteen days. Not uncommonly, mischief is done by insisting upon a too prolonged repose in the horizontal position; but there is more danger to be feared from the patient moving about the room and working with her infant after she is permitted to leave her bed. For ordinary healthy women it is wise to name the middle of the fourth week as the best time to venture out into the open air.

The bowels require close attention. When there is time, a mild purgative or warm-water enema should be given at the commencement of labor, and no further interference in this direction is called for until the third day, when a mild laxative will help to check any great tension in the breasts. Castor oil, in doses not exceeding 2 or 3 drachms, is the safest of all purgatives at this time. Where there is marked feverishness and constitutional disturbance, with fulness of the breasts, 6 drachms of Rochelle salt in half a bottle of aërated lemonade may be given, and repeated in four or six hours, if necessary.

The condition of the bladder will require watching, and the catheter may be required from time to time.

The bedclothing should be light, and the lying-in room kept cool and well ventilated, and it should be kept protected from the visitations of sympathetic and officious friends.

The diet for the first two days should be chiefly liquid, any ordinary fever dietary being selected, as weak tea and thin slices of toast, boiled bread and milk, gruel, rennet, etc. Upon the third day beeftea, chickensoup, and eggs may be allowed, followed in a day or two by boiled chicken, fish, steaks, chops, or roasts. The over-cautious, starvation method often does much harm, especially to suckling women, and from the first, milk may be allowed in small quantities at a time, but as frequently as the patient desires it. Where there are special reasons which hinder the mother from nursing her child, the diet should be as free from liquids as possible. Dry biscuits and unbuttered toast may be given, with very small quantities of meat.

As a rule, alcohol in some form should be always in the lying-in room, but it should be in a sealed bottle, never to be used except in some rare emergency, and then only under the special directions of the medical man. The practice of forcing nursing mothers to drink large quantities of porter, ale, or wine is a serious mistake. For all purposes milk in some form is all that is required, and *good* buttermilk, when procurable, is the best liquid nourishment after the first week for nursing mothers.

The treatment of the various complications which may arise during or after labor will be mentioned under their different headings throughout this volume. (See Hemorrhage, Post-partum, page 315; Perineum, Rupture of; Puerperal Fever, etc. For Ophthalmia Neonatorum, see under Conjunctivitis, page 135.)

LARYNGISMUS STRIDULUS.

This true neurosis is not to be confounded with false croup, though it is sometimes called by that name (see page 155). It is also often spoken of as laryngeal spasm, child crowing, spasmodic croup, etc.

Depending, as it does, in some way upon abnormal reflex excitability, and often associated with rickets, the treatment will resolve itself, to a great extent, into the treatment detailed under the headings of Rachitis, Delayed Detention, Infantile Convulsions, etc. If seen during the attack, which is seldom, as the onset is alarmingly sudden, and its duration exceedingly brief, the best thing to do is to dash a little cold water against the face and chest, and afterward plunge the patient into a warm bath. A whiff of chloroform may be administered. Faradization of the recurrent laryngeal, tracheotomy, or artificial respiration, or the forcible pulling forward of the tongue may be resorted to if the physician should happen to be present at an attack which does not yield to a dash of cold water. Ammonia to the nostrils may also be tried.

There is no time generally for the action of an emetic, unless in those cases where successions of attacks follow each other. Amyl nitrite should be worth trial, though the writer has never known of its use in this affection. In the intervals between the attacks, the diet and hygienic surroundings of the infant should be scrupulously attended to (see under Rachitis).

Of drugs, a certain amount of success has followed the use of bromides, chloral, musk, castor, morphine, emetics, nitro-glycerin, succus conii, and belladonna. The writer has obtained the best results from full doses of the bromide of ammonium, of which 2 or 3 grains may be given every three hours, or oftener, to a child one year old. Henoch speaks highly of morphine, pushed to the extent of causing drowsiness, but this treatment cannot be free from serious dangers, especially as the disease rarely, if ever, occurs except between the fourth and twenty-fourth months. Lancing of the gums may be tried, but there is little benefit to be expected. Recently antipyrine in small doses (1 grain every hour for a child one year old) has been reported as successful in preventing the return of the paroxyms.

LARYNGITIS.

Acute inflammation of the larynx, though to a variable degree an element in croup (see page 155) is for the most part easily distinguishable at the bedside.

Fagge separates croup from acute laryngitis by the broad distinction that in croup there is the dangerous dyspnœa, while in acute or acute catarrhal laryngitis the prevailing symptom is impairment of the voice.

The treatment is to be carried out upon the same principles as those fully detailed under croup.

The patient should be directed to give his larynx as much rest as possible, speaking being forbidden. He should he placed in bed in a warm room, the air of which should be saturated with the vapor of water. This may be accomplished by the use of the bronchitis kettle or by any of the various steam inhalers. The vapor of the compound tincture of benzoin may be used with advantage, the B. P. inhalation of conium, or the diluted vapor of a small quantity of weak tincture of iodine or carbolic acid.

Poultices, or warm fomentations, or spongio-piline, wrung out of hot water, should be applied to the larynx—the latter is the most convenient and soothing. Cold may be tried where warmth is found to aggravate. Warm demulcent drinks should be freely administered and perspiration encouraged. The following mixture for an adult is suitable, and where the symptoms are urgent an emetic may be first administered:

℞.—Liq. ammon. acetat.		℥ij.
Vini antimonii		℥ij.
Morph. hydrochlor.		gr. j.
Ext. conii fld.		℥jss.
Aquæ camphor.	ad.	℥x.—M.

S.—One tablespoonful to be taken every four hours.

Tracheotomy may be called for, and the after-treatment will be similar to that described under croup.

As the more urgent inflammatory symptoms are relieved, if pain persists it is best relieved by the following solution, which can be freely used as a spray every three or four hours or oftener:

℞.—Cocainæ hydrochlor.		gr. x.
Glycerini acid. carbolici (1 : 6)		℥ijss.
Aquæ rosæ	ad	℥x.—M.

S.—To be used occasionally as a gargle, and frequently as a spray.

As the symptoms pass off a weak gargle of tannic acid, 1 drachm in 8 ounces infusion of roses, may be used with advantage.

The treatment of chronic laryngitis as a cause of hoarseness has already been briefly referred to (page 367). The management of such cases is often most tedious and unsatisfactory. Rest of the vocal organs for a time is essential, and though every constitutional disturbance or error is to be corrected by improved hygienic surroundings, including change of residence for a time to a bracing or mild atmos-

phere, nevertheless the most striking results are always to be obtained by local remedies.

Nitrate of silver, used either in solution (30 to 60 grains to 1 ounce water) or as the mitigated or solid stick should be applied to the interior of the larynx every two or three days. The latter is a very severe and painful remedy. Often a weak solution (20 grains to 1 ounce) brushed daily over the interior of the larynx gives better results than the stronger solutions, which can only be used at considerable intervals. Chloride of zinc (2 grains to 1 drachm) is the best remedy when a purely astringent effect is desired.

These strong local applications can only be made by the physician —a serious drawback in the treatment and management of a chronic disorder—and hence the great value of sprays and inhalations, which can be used by the patient as often as deemed desirable. Of the astringent spay solutions the following are the best: alum 5 grains to 1 ounce), tannic acid (5 grains to 1 ounce), chloride of iron (5 to 10 minims of the weak liquor to 1 ounce), sulphate of zinc (2 grains to 1 ounce), sulphate of copper (1 grain to 2 ounces), and when an alterative effect is desired tincture of iodine (4 minims to 1 ounce), chloride of ammonium (10 grains to 1 ounce).

Bromide of ammonium (5 grains to 1 ounce), eucalyptus oil (2 minims to 1 ounce), fir-wool oil (2 minims to 1 ounce), bichloride of mercury ($\frac{1}{8}$ grain to 1 ounce), ipecacuanha wine (100 minims to 1 ounce), sulphurous acid ($\frac{1}{2}$ drachm to 1 ounce), may be employed.

Where dysphagia, pain, and irritable cough are distressing, a spray which the writer has found most useful is that formulated upon page 438, containing cocaine and carbolic acid.

Inhalations are useful when a soothing effect is desired, though other actions may be obtained by using various volatile substances in this form. Conium inhalation, hot water containing eucalyptus, terebene, fir-wool oil, creasote, menthol, carbolic acid, iodine, benzoin, or Friar's balsam, may be each advantageously used as an inhalation,

Good results may be obtained from the chloride of ammonium inhaler. Pinus pumilio oil, 15 minims to 1 pint water at 160° F., is a grateful inhalation. Insufflations employed by blowing finely pulverized substances, such as mixtures of powdered starch, bismuth, and morphine, are seldom followed by much relief.

The constant current, faradization, or static electricity may be tried with benefit in some cases of chronic laryngitis.

Rheumatic laryngitis is a very chronic and troublesome affection. Ingals has found benefit follow its treatment by the astringent and soothing sprays and inhalations mentioned above, but he relies mainly upon constitutional remedies directed to the diathesis, as iodide of potassium, salicylates, colchicum, cimicifuga, and guaiacum.

Tubercular laryngitis. Within recent years, especially since Koch's discovery of the bacillus tuberculosis, there has been marked activity and some progress made in this little corner of the field of therapeu-

tics. The treatment of tubercular disease of the larynx, as of any other region, will be feeble and unavailing if not directed chiefly against the hereditary or acquired condition which permits the growth and development of the microörganism. Consequently the various agents useful in the treatment of scrofula and phthisis, and every possible means whereby nutrition may be improved, must be scrupulously attended to before local remedies are seriously decided upon.

Local treatment may be mentioned under two heads—viz., (1) remedies used to relieve pain, dysphagia, and cough, and (2) measures directed to the removal of the local deposits or injured tissue.

Rest to the larynx should, as far as possible, be insisted upon, as the use of the voice prevents or retards the reparative process. Hot or cold currents of air, very hot or very cold foods, are to be also avoided, as well as tobacco smoking and the inhalation of irritating dust, etc., and the use of much alcohol. A warm, moist climate is much better than a dry, bracing atmosphere.

Cough should be quieted, as far as this can with safety be accomplished, by anodynes internally, and by soothing inhalations or sprays.

There are diverse opinions held regarding the value of cocaine in laryngeal suffering. The writer has satisfied himself of the very great comforts which its use affords for a brief period, in many cases beyond the reach of relief in any other way. It may be used as the spray previously mentioned, or a 10 per cent. solution may be brushed freely over the interior of the larynx. Glycerin of borax is a good vehicle for the drug. It consists of glycerin 4 parts, and borax 1 part.

℞.—Cocainæ hydrochlor. ℥ss.
Aquæ dest. ℥ss.
Glycerini boracis ad ℥j.—M.

S.—To be used as directed.

Cocaine is also employed in the form of an insufflation and in pastilles. After the use of cocaine sometimes the patient can take food with comfort when swallowing had been previously distressing or impossible, especially where there has been much ulceration or perichondritis present, and in the later stages of the disease its use will enable the physician to prolong life.

Insufflations of iodol, or iodoform, mixed with half a grain of finely-powdered morphine, have been used to relieve pain and dysphagia. The powder should be blown upon the ulcerated spots, the laryngeal mirror being always used. Bismuth and boric acid may be also employed with morphine instead of iodoform, and the ulcerated spots should first be well cleared of mucus before insufflation.

Neumann, who treats the early catarrhal stage by a solution of sulphate of zinc mixed with a 1 or 2 per cent. solution of cocaine, speaks in very high terms of the valuable and surprising anodyne effects of large insufflations of iodoform in those cases characterized by

extensive tubercular ulcerations. He also uses in less severe cases an insufflation of equal parts of boric acid and iodol, and in the later or final stages of the disease he finds a 5 to 15 per cent. cocaine solution of the greatest use in enabling the patient to swallow. He reports highly of lactic acid and tracheotomy, and thinks menthol inferior to cocaine.

Menthol is unquestionably, upon the authority of many specialists, of great value in the treatment of laryngeal tuberculosis. It relieves pain, acting as a local anæsthetic, and it is claimed for it that it destroys the local deposits of the disease. It may be taken internally at the same time, applied with a brush, or used as an inhalation, or injected.

The most satisfactory application for the local use of menthol is a solution of 1 part in 10 parts of pure olive oil. This may be brushed freely over the affected parts daily for long periods, but it is always better to employ a 20 per cent. (1 : 5) solution after the first week. It is not caustic, and its analgesic properties do not become diminished by repeated applications.

A 30 per cent. solution has been used, but it causes considerable pain, and is appareutly not followed by better results than those observed after the weaker solutions. The effects of the menthol can be kept up by the patient wearing a small Coghill's respirator for the greater portion of the day, with the sponge moistened with a mixture of creasote and menthol or other volatile antiseptics.

The following formula of Mr. Goskar is useful for this purpose:

℞.—Acid. carbolic.		℥ ij.
Creasoti purif.		℥ j.
Spt. chloroformi		℥ ij.
Thymol		gr. xxx.
Aquæ dest.		℥ xv.
Spt. vini rect.	 ad	℥ iv.—M.

Of measures directed to the destruction of the diseased or ulcerated spots there have been many reports from various quarters of successes and "cures" after the use of lactic acid. This is used in various ways, the simplest being to brush over the affected surface of the larynx with a 30 per cent. solution, gradually increased to a 75 per cent. solution. Some surgeons prefer to inject a few drops into the interior of the larynx with a laryngeal syringe. The pain and irritation following the application is much diminished by a previous swabbing with cocaine.

Allowing for the enthusiasm of the advocates of this method of treating tubercular laryngitis, there cannot be a doubt but excellent and lasting good results have been obtained. Some surgeons have injected the acid under the diseased mucous membrane, as others have injected iodoform, in the same manner and with the same intention. The writer has had no experience of the local application of this acid

to the larynx, but he has repeatedly satisfied himself about its striking action when applied to tubercular lupus on the face. It destroys the diseased tissue, and appears to have no injurious effect whatever upon the healthy structures in the immediate vicinity.

Not content with the action of 80 per cent. solutions of lactic acid, Ehring has gone a step further and scraped the ulcerated spots in the larynx until he removed all the diseased tissue, after which he applies the acid or injects it under the membrane. This he has done in 200 cases, with the report of twenty-eight cures. Keimer follows much the same practice. He rubs the acid in with a brush after curetting.

Kolischer injects the acid solution of phosphate of lime, which has been found to cause the absorption of tubercular or caseous masses in diseased joints. Prosser James, however, justly expresses a note of warning, and points out the dangers of these heroic interstitial laryngeal injections, and it would seem judicious at present to limit their use to the hands of experienced specialists. The same remark might be also applied to the deep scarifications recommended and carried out by Schmidt, and to the use of the galvano-cautery.

Where deep and extensive ulcerations exist, beyond the reach of these remedies, there may be nothing left to save the patient from a painful death but tracheotomy.

Where the difficulty of swallowing is great, and does not yield to cocaine, it may be necessary to feed the patient through a soft rubber œsophageal tube. Thick liquids are more easily swallowed than thin ones, and in some cases Wolfenden's plan of getting the patient to lie upon a couch or bed with his head hanging down over the side while he swallows may be successful.

Syphilitic laryngitis. The treatment should consist of vigorous constitutional remedies, suitable to the stage in which the syphilitic affection is existing at the time. In the latter part of the secondary stage of syphilis, rapid mercurialization should be carried out by inunction of mercurial ointment. Laryngeal mischief occurring during the tertiary stages of the disease is best met by heroic doses of iodide of potassium—20 grains three times a day, after meals, may be given. Where the case does not respond to the iodide, and the symptoms increase in gravity, a course of mercurial inunction should be at once commenced. The local symptoms can be best met by the various anodyne and astringent sprays and inhalations previously mentioned. A weak solution of corrosive sublimate (½ grain to 1 ounce) is the best spray to use in such cases.

Insufflations of iodoform are of the greatest use in many cases where much ulceration exists, and in the late stages of the disease cocaine may enable the starving patient to swallow with ease and safety.

The solid nitrate of silver may be freely applied to ulcerations, or a solution of corrosive sublimate (10 grains to 1 ounce) may be used, with the aid of the laryngeal mirror. Sulphate of copper (15 to 20 grains to 1 ounce) is a favorite local remedy.

Where there is much œdema, free scarifications may be needed, and sometimes tracheotomy may be demanded. After-treatment may be necessary for the removal of warty growths, cicatricial bands or webs, or narrowing.

LEAD POISONING—See Plumbism and Poisoning.

LENTIGO OR FRECKLES—See Chloasma.

LEPROSY.

Notwithstanding the labor expended upon the pathology of this terrible malady, it must be still included in the list of incurable diseases. By *absolute* isolation of the leprous from healthy individuals, and by the isolation of individual lepers, there is no doubt that the disease can be stamped out ultimately in districts ravaged by its presence. By the judicious and persistent use of certain remedial agents the disease may be retarded, and suffering may to a very considerable extent, be alleviated. Good food, moderate exercise, free ventilation, and as much pure open air as the patient's surroundings will permit, may be indulged in to advantage. Agents which improve nutrition, as tonics and cod-liver oil, are always useful. Iron, arsenic, iodine, phosphorus, mercury in minute doses, and a long list of vegetable substances, about whose physiological action nothing whatever is known, have been tried in vain. Of these latter empiric agents there are two which have met with results which warrant their recommendation as valuable palliatives. Some affirm that in mild cases they are curative, but the cases of leprosy which have been reported as cured by their use are not believed to have been true examples of the disease. These agents are gurjun balsam or oil, and chaulmoogra oil or its active principle—gynocardic acid. Both remedies are applied externally and taken internally at the same time. Both are unfortunately as repulsive as copaiba, and as liable to upset the stomach as this nauseous balsam.

Gynocardic acid in doses of 1 grain may be given in the form of pills after each meal, and the chaulmoogra oil may be administered in the form of capsules (5 minims in each), one three times a day, or as an emulsion or mixed with fresh cream. The dose should be gradually increased until the patient can bear no further addition, after which maximum amount may be persisted in as long as the patient remains able to swallow it without suffering diarrhœa or vomiting. Externally, the oil should be freely and forcibly rubbed into the affected regions after being diluted with twice as much pure lard (lanoline might be a better base for such an ointment). The frictions should be repeated several times a day for fifteen or thirty minutes each time, and a cloth or dressing saturated with the ointment should be left in contact with the diseased surfaces. From the beginning of the treatment the skin should never be permitted to get free from this greasy application,

except for the short time during which the patient is getting cleansed from time to time by hot baths, after which the frictions are to be immediately resumed.

Gurjun oil or dipterocarpus balsum, as it is also called, is likewise used both externally and internally, and most Indian physicians prefer it to the chaulmoogra oil. It may be given in the form of an emulsion in doses of 5 to 15 minims, or in the form of capsules. In India a tablespoonful of an emulsion made by shaking up 2 ounces of the oil with 6 ounces of lime-water is given twice a day, but the more civilized stomachs will not bear half this amount.

For external application a liniment made by shaking up equal parts of the oil, lime-water, and lard oil, should be rubbed in very often with moderate pressure.

Ulcerations are to be treated upon general surgical principles. Unna's ichthyol or resorcin ointments (25 per cent.) are good dressings to use after applying concentrated carbolic acid where the ulcerated surface is limited. Iodoform gauze may be employed in some cases, but oakum teased out carefully may make a cheap and very valuable dressing superior to all others where expense is an important object.

Unna uses a 10 per cent. pyrogallic acid ointment to the limbs, and a 10 per cent. chrysarobin ointment to the rest of the body, and in severe cases recommends that the tubercles be excised and ichthyol given internally for long periods.

Other antiseptics as creasote and carbolic acid (1 : 10), salicylic acid, boric acid, iodoform, creolin, corrosive sublimate, mercurial ointment, etc., have been used, but with very varying successes. Cocaine and morphine may be used to relieve pain and hyperæsthesia, and Crocker reports that stretching of the affected nerve in non-tubercular leprosy has been of much use in relieving paralysis and anæsthesia.

LEUCODERMA or VITILIGO

The white, rounded or circular patches in this disfiguring affection of the skin are practically beyond the reach of treatment. These patches are always surrounded by a zone of skin containing an abnormal amount of pigment; and as much of the deformity may be owing to the marked contrast between the two colorations, much may be done by removal of the increased pigmentation to render the appearance of the patient less remarkable. Weak solutions of corrosive sublimate (1 to 3 grains to 1 ounce), may be often used with much advantage for this purpose when the spots attack the face or upper portion of the neck. The writer has been able in one case to very materially improve the appearance of a female patient to whom the presence of this affection was a serious distress. Repeated applications of small circular blisters of the cantharides paper, which may be left in contact with the whitened patch for one or two hours at a time, may sometimes induce a slight amount of pigmentation. The blister should be a little smaller

than the unpigmented area. Internal remedies are useless, and galvanism is of little or no value.

LEUCOCYTHÆMIA or SPLENIC LEUKÆMIA.

In the early stages of this disease the reports of most trustworthy and eminent authorities prove that permanent recovery sometimes follows the use of certain remedies. These remedies are by common consent, however, held to be useless in advanced stages of the disease, and it comes consequently to be a question if they deserve any credit in removing the splenic enlargements and altering the condition of the blood when given in the early stages. It must remain at present an open question whether the so-called cures have any relation to the remedies employed. They might have resolved had no drug been employed at all. Until the natural history and progress of the affection have been thoroughly worked out by collecting cases in which no drugs have been employed, we are likely to remain in some doubt. Nevertheless, in the face of statements made upon the best authority, it must at present be considered our duty to give accredited remedies the fullest trial. When any history of ague has been made out the lines of treatment are very clear.

Improved hygienic surroundings, and attention to every error in living is of obvious importance; and where the patient resides in a malarious district, his removal to a healthy seaside resort should be early insisted upon when the season permits.

It is of importance to restrict the exercise of the patient to that of moderate activity, as violent movements of the body are not safe when a large vascular tumor like the spleen is suspended in the abdominal cavity. Chills and sudden variations of temperature are to be guarded against by warm clothing and avoidance of wettings. The pregnant condition, which is not a very rare complication of leukæmia, requires special care, and the lying-in period is not free from hemorrhagic dangers and anxieties.

Of remedies in the early stages, quinine holds the premier position, and there cannot be any doubt about its great value in those cases where any history of ague can be obtained. It must be given in large and repeated doses, such quantities being administered every eight hours, as will keep the patient constantly upon the verge of cinchonism. Often under its use the enlarged spleen will be found to diminish rapidly in size, and gradual improvement set in, in all the symptoms. The writer has, however, seen large doses in one *very recent* case fail to produce the slightest effect upon the tumor, but there was no history or evidence of malaria, and in spite of constant cinchonism from the earliest stage of the disease, it progressed steadily to a fatal ending.

When quinine fails to reduce the dimensions of the enlarged organ after a considerable trial, the following drugs in their order may be administered with some hope of success: phosphorus, $\frac{1}{30}$ grain, in pill, three times a day; iron, in 30 to 45 minim doses of the dialyzed liquid

preparation after each meal; arsenic, in the form of Fowler's solution, 5 minims, largely diluted with water, and given immediately after meals, three times a day; iodide of potassium, 10 grains in 2 pills, given in conjunction with cod-liver oil, or alone.

Electricity has a powerful influence over the spleen, and in conjunction with any of the above remedies, or alone, a strong, continuous current should be sent through the enlarged organ, one pole being placed on the ribs behind, and the other upon the abdominal parieties over the centre of the tumor in front. The electrodes should be enlarged and well covered with layers of leather, and moistened with warm saline solution, and the current from twenty Leclanché cells may be employed twice a day, for fifteen minutes each time, reversing and moving the electrodes about. Where no striking effects follow, faradization may be resorted to.

The practice of injecting ergotine into the tumor has not been followed by success sufficient to warrant its routine employment. A jet of cold water, directed with moderate force against the left side of the abdomen while the patient stands or lies partially immersed in a warm bath, has occasionally been followed by a diminution of the tumor and amelioration of the symptoms.

Inhalations of oxygen have recently been reported as successful, but this has been denied by many observers. The application of counter-irritants is of little value in reducing the size of the enlarged spleen, though pain may be relieved in this way. The ointment of red iodide of mercury has been employed, but its value is very doubtful. The writer has observed some benefit from wearing a large piece of spongiopiline smeared over with the liniment of iodide of potassium and soap (B. P.), and kept in its place by the pressure of a firm abominal binder. It it not easy to determine whether the benefit is owing to the iodide or to the pressure in this case, or to the friction sometimes employed in rubbing in the liniment.

In the advanced state of the disease all measures are worthless, and excision of the diseased organ has been invariably fatal in leukæmia. Some temporary delay has probably occurred to the advance of the fatal issue by transfusion, but occasionally it has appeared to hasten the end.

The various complications which arise, such as syncope, hemorrhage, peritonitis, pleuritis with effusion, dyspnœa, anasarca, etc., are to be treated upon the general principles detailed under the head of each.

LEUCORRHŒA.

As this is but a symptom of many different affections, a routine treatment is to be avoided. The first thing to do is to determine the cause of the discharge. It may arise from uterine displacements, endometritis, polypi, disease of the cervix, vaginitis, or inflammatory

conditions of the vulva. The treatment of most of these affections will be found under their appropriate headings.

Often, however, leucorrhœa may be found to depend upon constitutional conditions, and among weak, overworked young women it appears as soon as their unhealthy surroundings, irregular hours, or unwholesome food has reduced their vitality to the extent of producing a certain amount of anæmia and interference with digestion or assimilation.

In married patients, when an examination reveals an inflamed cervical canal or eroded os, the application of a strong caustic, brought into contact with the secreting membrane by a piece of cotton wool on a Playfair's probe through the speculum, is the first step in the treatment. Iodized phenol, prepared after the following formula, is the best agent for this purpose:

℞.—Iodi purificati ℥j.
Acidi carbolici ℥iv.—M.

S.—Make a solution with heat.

After a few applications of the above, any of the astringent lotions to be presently mentioned may be used until the discharge disappears. The writer has generally found that few cases of this kind resist one or two such applications, if the vagina be partially filled through the speculum with about an ounce of finely powdered boric acid, kept in position for twenty-four or forty-eight hours by a plug of absorbent cotton wool soaked in glycerin of borax (1 : 6).

Constitutional treatment with iron, tonics, sea-bathing, and change of air and scene, and the correction of any dyspepsia, constipation, or other departure from health, will greatly facilitate the disappearance of the discharge.

Pure carbolic or strong nitric acid, solid nitrate of silver, strong chloride of iron, or acid nitrate of mercury solution, may be applied to the interior of the cervical canal, instead of the iodized phenol.

In the leucorrhœa of unmarried patients, where vaginal examinations with the speculum are to be avoided if possible, less radical treatment is generally successful, especially as in a large proportion of these cases the discharge is simply vaginal. Here constitutional remedies are of the greatest importance, and foremost among them is iron. The scale preparations are the most elegant and efficacious, though when marked anæmia is present, full doses (30 to 45 minims) of the dialysed iron are better. The following is a good formula:

℞.—Ferri et ammon. citratis ℥ijss.
Acidi citrici cryst. ℥ijss.
Aquæ dest. ℥vj.—M.

S.—Take a tablespoonful three times a day with two tablespoonfuls of "alkaline mixture," during effervescence, after meals.

The alkaline mixture for the above is made by dissolving 5 drachms of bicarbonate of potassium in 12 ounces of distilled water.

At a later stage, tonics containing quinine and a diluted mineral acid may be substituted. Good food, pure air, cold bathing, moderate exercise, warm clothing, especial attention being directed to the covering of the feet and legs, early hours, and a change of scene, when convenient, are to be recommended.

Local remedies may be used in all cases, but the patient should be carefully instructed about their use either by the physician or through a nurse. Of the various forms of douche apparatus, the best is the simple rubber, Higginson's syringe. It is, upon the whole, preferable, in the class of cases immediately under notice, to the syphon apparatus with the suspended can and long tube. A soft vagina pipe, with the extremity perforated by several apertures, should be used.

The various astringent solutions should be injected warm at first, but as the patient becomes familiar with their use the temperature may be gradually lessened until, in summer, liquids of the same temperature as the surrounding atmosphere may be used.

The sitting posture is the most convenient, and the injection or douche may often with advantage be administered when the patient is in a warm or sitz bath. Two points, frequently overlooked in the use of astringent douches, are of much importance: at least 1 quart (or 40 ounces) of the solution should be used at each time, and the vagina should be first thoroughly flushed out by a stream of warm or tepid water before the introduction of the astringent. When this latter precaution is not taken, the injection of the remedy may cause coagulation of any secretions in the vagina and lower part of the cervical canal, and the coagulated or thickened secretion adheres tenaceously to the diseased membrane, and prevents the action of the solution, or it may even, by its presence, become a further source of irritation.

Moreover, a stream of hot water has been found by itself to be a powerful alterative to the diseased mucous surface of the vagina, and is a favorite remedy with some physicians who only employ astringents after they have found it to fail in reducing the amount of the discharge. It is found to act best where there is marked congestion of the vaginal or uterine walls.

Where the ordinary astringent injections and plugging with boric acid fail, it is recommended to paint the interior of the vagina over with a strong solution of nitrate of silver or other caustic. This should seldom be resorted to, though where there is much excoriation or vulvar congestion, with intense itching, the 30 grains to 1 ounce solution freely applied often gives speedy and lasting relief. The writer's ointment of conium is an invaluable sedative in such cases. (See fifth edition of *Pharmacy, Materia Medica, and Therapeutics*, page 412.) Where the discharge is profuse, the external surface should be well protected

from the irritating discharge by being smeared over with some greasy preparation (see Eczema, page 226), and the vaginal douche should be used three or four times a day; in ordinary cases, twice daily will be found often enough.

Remedies in the form of medicated pessaries are, as a rule, objectionable. As the mass melts it mixes with the discharge, and makes a disagreeable mess, which adds much to the patients discomfort.

Belladonna, creasote, carbolic acid, tannin, iodoform, bismuth, etc., are used in this form.

The following are the usual astringent injectians enumerated in the order in which the writer has found them in his experience to be best suited for ordinary vaginal leucorrhœa:

Powdered alum, ¾ ounce to 1 quart of tepid water.
Powdered borax, ¾ ounce to 1 quart of tepid water.
Boric acid, ¾ ounce to 1 quart of tepid water.
Sulphate of zinc, 2 drachms to 1 quart of tepid water.
Iron alum, 2 drachms to 1 quart of tepid water.
Tincture of iron, 2 drachms to 1 quart of tepid water.
Sulphate of copper, 30 grains to 1 quart of tepid water.
Tincture of iodine, 30 minims to 1 quart of tepid water.
Carbolic acid, 2 drachms to 1 quart of tepid water.
Acetate of lead, 30 grains to 1 quart of tepid water.
Lime-water, injected in its strength, or mixed with as much water.
Tannic acid, 1 drachm to 1 quart of tepid water.
Corrosive sublimate, 5 grains to 1 quart of tepid water.
(This powerful agent is not suitable for constant daily use.)
Bicarbonate of soda or potash, 2 drachms to 1 quart of tepid water.
Permanganate of potash, 5 grains to 1 quart of tepid water.
Chloral hydrate, 40 grains to 1 quart of tepid water.
Nitrate of silver, 20 grains to 1 quart of tepid water.

Infantile leucorrhœa is most generally of vulvar origin, and may be often treated as a simple intertrigo by absolute cleanliness and a lotion composed of any of the above solutions.

LICHEN.

The lichen group of skin diseases is still in confusion, some authorities describing the different varieties of the affection by names which are applied to totally different diseases by other writers. Some of the diseases grouped together as lichen have nothing in common with each other. Lichen ruber or planus is best treated by arsenic internally. It is often most tedious in its response to remedies, but the steady and persistent use of arsenic will almost always reward the physician in the end. The fullest doses should be persisted in for long periods, beginning with 3 minims of Fowler's solution. This amount may be cautiously increased utill 8 or 12 minims are given three times a day. After reported failure, success is said to have been achieved by the hypodermic administration of the drug, freely diluted with water.

With the arsenic may *for a time* be combined iron, cod liver oil, and every remedy or food which improves nutrition and raises the standard of health. Sleep is of much importance; overwork and worry, with irregular hours, has a more aggravating influence than is generlly recognized.

Where arsenic cannot be tolerated, or where it fails to make a decided impression upon the disease, the recognized plan of procedure is to resort to a mild mercurial course. The biniodide of mercury, in the form of minute pilules, each containing $\frac{1}{32}$ grain, may be given after each meal. The bichloride is most often used, $\frac{1}{16}$ grain in solution three times a day. Many other remedies have been advised, but if arsenic and mercury fail, except phosphorus no other drugs appear to have any specific action.

Locally, the treatment best suited to lichen planus is that which gives good results in psoriasis—*i. e.*, a stimulating tar ointment. The liquor carbonis detergens and the oil of cade (1 drachm to 1 ounce of lard) are good substitutes for the ordinary tar ointment.

The treatment must, however, largely depend upon the presence or absence of itching. When this is a marked feature, the management of the case is difficult. If the papules are confined to a small surface of the body, a solution of 1 ounce of bicarbonate of sodium dissolved in 30 ounces of water is a good sedative lotion. Where large tracts of the skin are involved, hot alkaline baths, frequently administered, are indicated. A lotion consisting of 1 ounce of the liquor carbonis detergens, 1 ounce of strong solution of acetate of lead, in 40 ounces of distilled water, may be tried. The following modification of Unna's ointment is often very useful:

℞.—Hydrarg. chloridi corros.	gr. j.
Acid. carbolici	♏xxv.
Ungt. zinci oxidi	℥j.—M.

Carbolic acid or creasote, in the form of ointment (1 : 20), or as a lotion (1 : 50), may be used. Nitrate of silver, 20 grains to 1 ounce of spt. ætheris nitrosi, may be painted over the itching surface when the above remedies fail.

For *lichen scrofulosorum* the remedies suitable for scrofula are indicated—*i. e.*, cod-liver oil with syrup of iodide of iron, and at a later stage small doses of arsenic in combination with iron.

Lichen pilaris readily yields to weak alkaline baths and friction, followed by the inunction of any bland oil like the oleum olivæ or cod-liver oil.

LIGHTNING INJURIES AND ACCIDENTS,

Unfortunately becoming rather common since the introduction of the electric light as a means of illumination, are to be treated upon general principles. The shock or collapse is to be met by the remedies already

mentioned upon page 133. Thus, warmth and friction to the surface of the body with the hypodermic or rectal administration of diffusible stimulants such as alcohol, ether, or ammonia; the cold and hot douche alternately, with artificial respiration, may be resorted to. Burns and injuries to nerve-trunks are to be treated at a later stage by appropriate dressings and massage or a weak continuous current.

LITHIASIS—See Stone in the Kidney.

LIVER, Abscess of.

The ordinary pyæmic abscess is to be met by the treatment supposed to be useful in cases of pyæmia, but in the vast majority of cases it may be regarded as beyond the reach of art.

In cases where the abscess has resulted from tropical hepatitis, or where it has followed some ulceration in the intestines or stomach, as not very rarely occurs in this country, the affection is generally susceptible to marked improvement or complete cure.

When seen before suppuration has occurred the hepatitis should be met by the remedies to be mentioned further on. When, however, the abscess has already formed, and the physical signs warrant a diagnosis of one large abscess, and not a series of small or multiple abscesses, the removal of the pus is justifiable. If the operator waits for a spontaneous opening he may see the patient sink from exhaustion or from rapid peritonitis, caused by the internal rupture of the abscess.

The operation is a simple one, and may be performed by thrusting in a moderately fine trochar and canula into the swelling, and evacuating its contents by a Dieulafoy's aspirator. Unless the abscess be of very great dimensions it may be completely emptied at once. There is often no necessity for the insertion of a drainage-tube. The writer has seen one tapping cure the condition. Some operators prefer to secure adhesion between the abdominal walls and the sac of the abscess by the local application of caustic potash or lime before tapping. This is seldom necessary when a fine trocar is used, or when the puncture is made in an intercostal space.

Where there is reason to suspect that a second abscess exists after the first has been tapped, the trocar and canula may be withdrawn and inserted in another situation, and it has been over and over again proved that puncture of the liver in this way does not lead to any trouble, but that it has been the means of relieving acute hepatitis where no suppuration had occurred.

The puncture should be made at any spot where the physical signs show that pointing would likely to occur if left alone. As a rule, the puncture below the ribs is better than in an intercostal space.

Hepatotomy has been several times performed successfully in urgent cases by opening the abdomen freely over the most prominent part of the tumor, which is then tapped, the abscess cavity freely opened, and

its edges or lips sutured to the margins of the skin wound, after which thorough drainage is established, and suitable dressings applied. Excision of portions of one or more ribs may be required. (See under Hydatids, page 369).

LIVER, Amyloid Disease of.

Under the heading of Bright's disease, upon page 79, the treatment of amyloid disease of the kidney is briefly described. For amyloid liver, which so often coincides with the renal change, the treatment is the same, and may be briefly summed up in the removal of the cause when possible. Syphilis, pulmonary suppuration, bone disease, or chronic abscess, if remedied in the early stage, may be followed by the complete restoration of the disorganized kidney or liver. In the later stages palliation of the symptoms is the most that can be thought of. Of internal remedies, iodine or iodides, with full doses of iron, afford the best advantages which can be hoped for among drugs. Life may be pralonged by a sojourn at a dry and elevated spot near the coast, and a long sea voyage is beneficial. The natural iodine mineral waters may be tried with much advantage, and in conjunction with these, large doses (30 grains) of the chloride of ammonium may be administered.

LIVER, Acute Atrophy of.

The treatment of this affection may almost be regarded as hopeless. Where a case has been reported as a success after the administration of any remedies, the general tendency has been to regard it as an instance of mistaken diagnosis. Success has been attributed to copious purgation by salines, and in fatal cases marked temporary improvement has been observed by this method of treatment. Hence in a disease so formidable saline purgatives may well have an extended trial.

When cerebral symptoms or coma supervene purgation should be pushed as far as possible, and the treatment (detailed under Bright's disease) suitable to uræmic poisoning should be vigorously carried out. High temperature may be treated by large doses of quinine, or by the newer antipyretics, and symptoms as they arise should be met by remedies administered upon general principles.

LIVER, Cirrhosis of.

Under ascites, the treatment of this malady has been briefly mentioned. As it occurs in the great majority of instances among "spirit" drinkers, the first step in treatment is to operate very decisively upon the cause. Alcohol, in every form, should be forbidden. Where it is found impossible to carry out this rule, the physician should insist upon whatever alcoholic liquor the patient indulges in, being very largely diluted, and taken after meals. The extent to which the dis-

ease may yield, even when established beyond doubt, is rather underestimated. The writer has had considerable experience of it, especially among the male operatives in large linen manufactories, where a very common practice among the "hacklers" of flax is to drink raw whiskey before commencing their daily work in the early morning, previous to breakfast, in order to relieve the chronic bronchitis and emphysema which almost constantly result from the nature of their employment, which necessitates their being in an atmosphere of fine flax dust. Where relief can be obtained by suitable bronchial remedies, and the hackler or flax-dresser can be made to give up his dram-drinking, permanent improvement sets in in the cirrhosed liver. Change of occupation is of vital importance in dealing with cirrhosis in publicans, barmen, and waiters. It is almost impossible for such men to abstain, once they have become enslaved to alcohol, unless a new sphere of labor be opened up to them.

Active open-air exercise or labor is of great importance, and the diet should be plain and nutritious. Attention should be paid to the amount of liquids imbibed. Where there is as yet no sign of effusion into the peritoneal cavity, a liberal allowance of liquid food is very desirable. Milk, skimmed, may be taken in large amount mixed with an equal quantity of aërated water, and the best diet is a liberal fish dinner and breakfast. A few months of vegetarian living often give excellent results. In Ireland, buttermilk or the home-made koumiss, mentioned on page 23, affords a most valuable dietary in such affections as the one under notice.

Purgatives are useful at all stages of cirrhosis, and saline cathartics as Epsom or Carlsbad salts and the various purgative mineral waters are the best. By an occasional dose of blue pill given at bedtime, followed by a morning saline, the portal system is very powerfully influenced. Mercurials should be avoided where there is any renal mischief associated with the hepatic lesion. Podophyllin may be then employed.

By the daily administration of one large saline draught before breakfast, following the occasional dose of podophyllin or a mild mercurial, marked diminution may be repeatedly observed in the liver in those cases where considerable enlargement, with induration, accompanies or precedes the fibroid change in the organ. Mercury may be also given for about a month in small doses, alternating with large doses of iodide of potassium, administered for a similar period. Murchison attached importance to the action of the chloride of ammonium, and green iodide of mercury ($\frac{1}{2}$ to 1 grain, three times a day). These remedies, in the great majority of cases, cannot be pushed with safety, especially as most of the victims of cirrhosis are suffering from gastric troubles. Many of them are debilitated from want of proper food, having long since ceased to live with regularity and prudence. In such cases there is no remedy so frequently applicable as the diluted nitro-hydrochloric acid in full doses, combined with a vegetable bitter

in small amount. It may, moreover, be given at the earliest, and is often grateful during the later stages of the disease. As this acid is liable to decomposition, it is very often disappointing, and fails to give any evidence of therapeutic power. It should consequently be seen that the specimen be of moderate age, and that it has been carefully preserved in a stoppered bottle. The nitro-hydrochloric acid bath is prepared by mixing 1 ounce of strong nitric and 2 ounces of hydrochloric acid in 2 gallons of warm water. A local pack may be administered by soaking cloths in the mixture and applying them to the abdomen and lower part of the chest. The writer, however, prefers to apply the acid mixture in the above strength upon spongiopiline worn under a bandage over the entire hepatic region. As soon as any eruption appears the acid may be discontinued, but in some cases the mild counter-irritation produced by covering the acid lotion with an impervious tissue in productive of benefit.

The following is a good combination; it acts directly upon the liver, and at the same time tends to relieve the craving for alcoholic stimulants:

℞.—Acid. nitrohydrochlor. dil.		℥ss.
Ext. tarax. fld.		℥ij.
Tinct. nucis vomicæ		℥iij.
Ext. cinchonæ fld.		℥iijss.
Infus. chiratæ	 ad	℥xij.—M.

S.—A tablespoonful in a wineglassful of water, to be taken four times a day, before food.

When, notwithstanding the change in the patient's habits and the use of the above remedies, ascites sets in, the remedies are to be continued. Cure is still not beyond hope; and the writer has seen recovery follow where tapping had been deemed necessary. The treatment of ascites will be found fully detailed under its own heading upon pages 53 and 54.

In the *Gazette Médicale de Strasbourg* of May, 1889, an extraordinary case is reported, where the patient, having been tapped over fifty times, drank 8 ounces of the ascitic fluid, and the ascites did not return.

Vomiting may be met by counter-irritation over the gastric region, with ice and effervescing mixtures internally. Bismuth, alkalies, hydrocyanic acid, and morphine perules ($\frac{1}{16}$ grain in each) may be tried. Pepsin is useful in some cases, and peptonized food often may be very valuable when the condition of the gastric membrane is much deranged. Hemorrhage from the bowels, hæmorrhoids, diarrhœa, and other complications are to be regarded as more or less conservative, and not to be interfered with too soon.

When hæmatemesis is sufficiently serious as to demand interference, the remedies indicated are enumerated under Hæmatemesis upon page

301. Death not unfrequently occurs from the rupture of varicose veins situated at the lower end of the gullet, and for which treatment is of little avail.

LIVER, Cancer of.

All treatment can at the most be palliative, and is to be carried out upon general principles. Thus pain is to be relieved by opium, constipation by enemata or mild cathartics, vomiting by ice, morphine perules ($\frac{1}{16}$ grain each), and counter-irritation, and the collection of fluid in the peritoneal cavity must be removed by tapping when the symptoms become urgent.

Under Cancer of the Liver, upon page 105, the recent case where Lücke excised the diseased mass is referred to.

LIVER COLIC—See Gall-stones and Jaundice.

LIVER, Congestion or Inflammation of.

Where this is owing to valvular affection of the heart, the appropriate treatment will be found mentioned under Heart—Valvular Lesions of, page 352.

In active congestion or hepatitis from indiscretions in diet, malaria, chills, etc., the cause is likewise to be as far as possible removed, after which rest, a milk diet, a moderate dose of calomel, followed by purgatives of the saline class, smart counter-irritation, the mineral acids, especially the dilute nitrohydrochloric, chloride of ammonium, ipecacuanha in full doses, and in severe cases leeches to the margin of the anus may be employed.

LIVER, Hydatids of—See Hydatids, page 367.

LIVER, Injuries and Rupture of.

Absolute rest in the horizontal position, and after the symptoms of shock and collapse have been met by appropriate remedies, a full dose of morphine hypodermically may be administered. Where there is reason to suspect that hemorrhage into the peritoneal cavity is occurring, ice or Leiter's tubes should be applied over the hypochondriac region. The intense thirst, which is often a prominent and distressing symptom, is best relieved by sucking small pieces of ice and swallowing small doses of champagne.

Peritonitis, when it develops, is to be met by cold applications or warm poultices, opium, and the remedies mentioned under Peritonitis. Abdominal section has been recommended, the peritoneal cavity being thoroughly freed from all clots, after which drainage and the various measures employed in the after-treatment of ovariotomy may be carried out. Wounds of the liver have been recently treated with success, after abdominal section has been performed, by applying the thermo-

cautery, by plugging the wound with iodoform gauze, and also by suturing the wounded gland tissue.

LIVER, Syphilitic Disease of.

The treatment of this affection will consist in the persistent use of the remedies indicated in the treatment of the later stages of syphilis—*i. e.*, mercury and iodide of potassium, the latter in large doses. Complications, as pain, peritonitis, jaundice, vomiting, or ascites, being dealt with upon the principles already mentioned.

LOCOMOTOR ATAXIA.

The treatment of this affection is too often approached in a half-hearted fashion. Upon the authority of Erb, at least two cases *almost completely recovered* under treatment. The writer has seen improvement take place which almost amounted to recovery in one case, and he has under observation a patient who has had the disease in a well-marked degree for at least twenty-five years. In this case periodical treatment has enabled the patient to hold a responsible position without any material increase in his ataxic symptoms.

As long as locomotor ataxia is regarded as incurable, the treatment will likely be carried out in such a way as will give very unsatisfactory results. No doubt improvement and long stationary periods in the progress of ataxia occur where no drugs have been given, nevertheless clinical experience confirms the view that drugs are often useful.

The patient should be placed in the most advantageous position possible, excess of mental and bodily fatigue being forbidden, regular hours, good nutritious food, and warm flannel clothing from head to foot being recommended.

Of the long array of drugs vaunted from time to time as specifics only a few need be referred to, as the greater number of them have been found by large experience to be useless or injurious.

Nitrate of silver has been found more generally useful than any other drug. Quarter-grain doses may be given in the form of a pill three times a day. Some authorities recommend 1 grain three times a day. The great objection to its use is the danger of its causing a permanent discoloration of the skin when adminittered for prolonged periods. The oxide in double the above doses is less liable to cause gastric disturbance, and appears to be equally valuable.

The chloride of gold and sodium (U. S. P.) is the drug upon which the writer places most reliance. Bartholow has shown that its administration tends to produce absorption or atrophy of the connective tissue, especially when of pathological formation. No discoloration follows its continuous use, and in doses of $\frac{1}{16}$ grain three times a day the writer has not found any drawbacks. It may be given best in

pilular form, or in solution in distilled water, without the addition of any vegetable substances.

Arsenic, phosphorus, ergot, calabar bean or eserine, pilocarpine, bromides, chloride of barium, and iodides may be tried where gold and silver fail to give amelioration of the symptoms, or where they cannot be tolerated.

Much difference of opinion exists about the relation of ataxia to syphilis. This is a matter of much moment in treatment.

Iodide of potassium, in full doses (5 to 15 grains) three times a day, has often been found to cause marked improvement. This drug is clearly indicated where there is a history of syphilis, but the writer has seen benefit from its administration in cases where there was no reason whatever to believe that syphilis had ever existed. Occasionally it will be found to produce marked influence for good over the lightning pains.

The association between syphilis and ataxia has been overstated. Even where there is a close history obtainable, the disease fails to respond to the ordinary anti-syphilitic remedies.

Bichloride of mercury is, nevertheless, worthy of a trial, and may be found not unfrequently to be followed by some steady improvement up to a certain point, after which it appears to be worse than useless to push it. This is also true of the iodide treatment, whether there is or is not a syphilitic history. In one case of very long standing under the care of the writer there was a most extraordinary intolerance of even infinitesimal doses of the iodide. This was probably a coincidence. Tonics, like the diluted mineral acids with quinine, may be given from time to time during the pauses in the above-named drug treatment, but there appears to be a general feeling against the administration of strychnine.

Outside the list of drugs there are remedial agents of decided value in the treatment of ataxia.

Electricity stands at the head of these. Rarely does its steady administration fail in producing some benefit, but, like all the previously mentioned methods of treatment, it leads to improvement up to a certain point, and, when the symptoms seem stationary for a time, the patient tires of treatment until a fresh advance in his troubles urges him again to seek some relief from the battery. The continuous current gives the best results.

One pole may be placed upon the upper part of the spine in the cervical region, and the other one over the lower lumbar spines, and the current from fifteen to twenty Leclanché elements should be allowed to pass for about five minutes twice daily. A current, from three or four cells, should also be passed through the brain for a few minutes. A very good method is to place the positive pole upon the upper spines, and drop the negative into a warm or tepid foot-bath, in which both lower extremities are immersed for five or ten minutes. Where the continuous current fails to afford any signs of improvement

in the patient's condition, faradic electricity has been employed, but it seldom will be found to be of any value. The faradic brush has been very favorably reported upon. In the majority of cases the continuous current will be found to have some beneficial effect upon the frequency and intensity of the lightning pains. Where these are very severe, the current may be applied to give relief at the time by placing the positive electrode upon the painful region, and the negative upon some indifferent point.

Static electricity has also given good results, but the writer cannot speak from any experience of its action.

Hydropathy is of use in some cases, and may be carried out in conjunction with the gold treatment internally and with electricity. Cold packs, the combination of douche and massage, or spray and needle baths, with frictions and manipulations applied to the spine and lower extremities, may be employed. All warm or hot baths must be forbidden, though Leyden recommends the free use of baths at 86° to 95° F., and also of brine baths.

Counter-irritation has been long tried, and it formerly was a common occurrence to find ataxic patients covered from the occiput to the heels with marks of old blisters and cautery-irons. Brown-Séquard still recommends this practice, and apparently believes in its efficacy in cutting short the progress of the disease and relieving the various symptoms.

There yet remains to be mentioned a comparatively new method of treating locomotor ataxia which is still receiving a great deal of attention from observers in all parts of the world. Suspension, as carried out by Charcot, is still too short a time in use to enable one to formulate any positive statements about its permanent benefits. Like every other remedy hitherto used in the treatment of locomotor ataxia, the most that can be said is that "very great" or "very marked" improvement was found to follow its use. No case where a complete disappearance of the fully-established disease has been reported as following the new method, though, upon the whole, most encouraging reports have been furnished.

There is, however, this great danger that the reports of improvement are so exaggerated in some cases as to cause disappointment to those who try the method expecting too much. Signs are not wanting that this is already occurring, and to some extent discrediting the method. The writer has seen considerable improvement follow suspension, but his experience is much too limited to justify his forming any opinion of its real value. Charcot has found that the ataxia and lightning pains are markedly relieved, and a large number of observers have corroborated his statement. These improvements have followed a few suspensions in some cases; but, as a rule, there are generally no very striking results until after about a dozen suspensions, The improvement sets in most rapidly in the most chronic and severe cases, and in some cases is described as very remarkable.

The first effects noticeable are improvements in walking and steadiness in standing, in several cases the patient being surprised to find that he can dispense with the assistance of his staff, and can stand when his heels are brought together. Gradually bladder and rectal troubles, increased or diminished sexual desire, gastric crises, lightning pains, giddiness, sleeplessness, anæsthesia, spasm, and paralysis are markedly improved. In some cases no amelioration of the symptoms has been observed, but in the majority of over 600 cases already reported the above beneficial changes have been more or less noticeable in a large percentage of them. The absent knee-jerk has only been reported to have returned in two cases, and there has been very little of an improvement observed in vision or in eye symptoms. One of the most constant and marked features following suspension has been noticed in the functions of the genital apparatus, total loss of sexual power and desire being very often replaced after suspension by frequent erections and sexual appetite.

Several deaths from strangulation have occurred already by patients attempting to carry out self-suspension without professional assistance being at hand, but with the improvements recently introduced and to be mentioned presently there is very little danger of any such result in the hands of a careful physician.

Of the rationale of this method of treating locomotor ataxia and other spinal lesions much has been written and little need be here repeated; suffice it to say, that the discovery of its advantages may be said to have been the result of an accident in the first instance. Charcot believes that suspension acts like a nerve-stretching operation, and that at the same time important changes in the circulation take place. Lauder Brunton is inclined to believe that it acts like massage on a muscle, and thus insures the removal of waste products and lymph, at the same time increasing the processes of repair and oxidation by promoting a freer blood circulation. Althaus suggests that suspension produces its good effects by stretching and breaking down the newly-formed connective tissue resulting from inflammatory changes about the posterior nerve-roots (which exerts pressure upon the nerve tubules), and thus enables them to resume their functions if not already destroyed. He thinks that in disease originating in the neuroglia of the cord a similar loosening or breaking up of the new connective tissue takes place, and provided the axis-cylinders are not already destroyed their conductivity may be more or less perfectly restored. The value of the suspension treatment of locomotor ataxia, whether curative (which is not probable) or merely palliative, is, however, only to be judged by careful and impartial reports of large numbers of cases treated by competent observers.

The method of suspension can be carried out by the use of Sayre's apparatus, consisting of a tripod and pulleys and hook, from which a transverse bar is suspended to which are attached a strap for the occiput, and one for the chin, and one for each armpit. The success of

the suspension will greatly depend upon the adjustment of the chin and occiput straps. These must be carefully padded and so applied that the pressure is as evenly distributed as possible. The armpit straps being adjusted so as to bear a portion of the body weight, the patient is gradually and cautiously lifted by pulling on the cord until his toes are only left in contact with the ground, when if the straps are seen to be properly adjusted, the entire body is completely suspended. Half a minute is enough for the first suspension, and this may be gradually extended until two or three minutes can be borne with comparative ease. Where a suspension exceeds two minutes the patient should have a few seconds rest. The patient should remove his coat and collar, and when suspended his body should be prevented from swinging. The proportion of the weight borne by the arm-straps is a point of much nicety, and must depend upon the weight of the patient. There is no doubt that very little, if any, stretching of the spinal cord can take place when a patient is leaning much of his weight upon the arm-straps, and where the patient is light they can be altogether dispensed with, as practised by Hammond who goes further, and with very light patients, in addition to a suspension by the head alone, he attaches weights to the feet so as to more thoroughly stretch the spinal cord. Heavy patients cannot bear suspension by the head alone, and at first it is wise to permit them to bear a considerable portion of their weight upon the arm-straps, after which, while still suspended, by making them abduct their arms the weight can at will be almost entirely thrown gradually upon the head.

There are several objections to the tripod. It is very likely to be upset by ataxic patients who seize one of the legs in order to steady themselves, and it is seldom strong enough to bear very heavy weights. There is no question that a simple hook inserted by a long stout screw into one of the joists above the ceiling of the physician's study is much better.

By hanging a spring balance between the hook and the cross-bar the weight of the patient and the amount of tension can be easily ascertained, as suggested by Watteville. The writer has suspended patients by both methods, and he has also suspended himself, and the introduction of the spring balance or dynamometer appears to take away from the discomfort of the performance.

Weir Mitchell's ingenious apparatus removes most of the difficulties just enumerated. He does away with the armpit straps, which, at the best, are painful and most unsatisfactory, and for them he substitutes two leather slings. The patient, with his arms gently and comfortably folded in these slings, can rest suspended for almost any length of time without much discomfort. The chin and occiput strap is the same as in Sayre's apparatus, but there is the great improvement of two separate pulleys—one for the arms and one for the head. By pulling upon the arm pulley the patient is lifted off the ground by his elbows, and, when suspended, by pulling gradually upon the cord of the head

pulley the proportion of weight upon the head can be adjusted with nicety. If necessary, all the weight can be transferred gradually to the head. This simple and ingenious contrivance is figured in *The Retrospect of Medicine*, edited by James Braithwaite, M.D. Lond. Vol. 100: July to December, 1889.

As already stated, two or three minutes' suspension is enough, and there should be an interval of two or three days. Three times a week appears to be the general practice of most of those who have published their reports. The writer has adopted the routine method of three or four suspensions of sixty seconds each in all cases.

Suspension is contra-indicated in valvular disease or aneurism, phthisis, emphysema, profound anæmia, debility, or obesity.

It is perfectly certain that this method of treatment is steadily losing ground, and that the very glowing hopes raised by the first enthusiastic reporters have not been justified. Nevertheless there cannot be a question that it has given better results than all other treatments in this practically incurable affection. It is, however, predicted for it that it will die a natural death in a few years.

Bonuzzi has introduced the plan of forcible flexion of the spine as a substitute for suspension. It is carried out by forcibly pulling up the lower extremities as the patient lies upon his back with a towel tied around his ankles.

The various symptoms of locomotor ataxia are to be met by appropriate remedies. Thus the action of galvanism and iodide of potassium upon the lightning pains has already been referred to.

Antipyrine or antifebrin has also given excellent results in moderate doses, but sometimes the hypodermic injection of morphine must be resorted to. The application of ether spray to the part often relieves. The lightning pains have also been found to yield to exalgine, phenacetin, chloralamide, pilocarpine, and pyrodin or acetylphenylhydrazin.

The gastric crisis is best met by smart counter-irritation, with morphine hypodermically, followed by gastric sedatives.

LUMBAGO.

Large doses of salicylate of sodium, 30 to 40 grains of the *pure* salt, may cut short the attack suddenly. Antipyrine or antifebrin, in one or two full doses sometimes gives marked relief in the same way. If pain is not speedily relieved by these measures, and if it is *very* severe, a hypodermic injection of morphine may be given, and the salicylate treatment continued, or salol may be tried. In less acute cases the favorite treatment has been also anti-rheumatic, and almost every remedy of this class has been tried. Actæa racemosa or cimicifuga, in 30 minim doses of the fluid extract, may be given every four hours.

Large doses of bicarbonate of potassium (1 drachm) in effervescence,

with one ounce of fresh lemon juice, is an excellent routine treatment.

Ten-grain doses of the nitrate of potassium in whey every two hours for three doses, then every six hours may be tried.

The writer has been surprised sometimes to find that speedy and permanent relief followed one large dose (a good wineglassful) of gin made in the form of punch, and recently he makes this his first step in the treatment of all severe and acute cases.

In chronic cases, where the above remedies have failed, sulphur, quinine, turpentine, iodide of potassium, guarana, and caffeine have been used with varying success.

From the above list it will be evident that the constitutional treatment of lumbago is uncertain, and the same experience will be found in the use of local or external remedies. What relieves promptly in one case will fail in the next, or in the same patient at some future time. The hot-air bath or the ordinary Turkish bath often gives relief. The warm bath is of little use, but a hot bath (temperature 106° F.) generally is soothing.

Hot poultices are not so good as a local hot pack, with a warm douche or massage afterward, or dry cupping.

When the above measures have been carried out, a large thick pad of warm absorbent wool, sprinkled over with sulphur, should be applied to the painful region, and a firm broad flannel binder or bandage adjusted over it. Absolute rest in bed is then to be maintained, and the constitutional treatment with the above-mentioned remedies is to be kept up. Sedative liniments at a later stage may be rubbed in or applied under oiled silk. The following is a valuable combination:

℞.—Lin. belladonnæ ℥ij.
Tinct. aconiti ℥jss.
Lin. chloroformi ℥ijss.—M.

S.—To be sprinkled freely over lint, applied to the painful region, and covered with oiled silk.

Squire's chloroform of belladonna is also a powerful local sedative. The belladonna plaster, and the belladonna extract rubbed up with glycerin, are often used, but they make a nasty mess of the patient's clothing, and are in no way superior to the liniments. The plaster of belladonna mixed with an equal amount of the plaster of opium, and spread upon leather, with a very wide non-adhesive margin, is, perhaps, the best local application when the patient begins to move about again. The back may be strapped with such a plaster when movement continues to cause very severe pain. The ether spray or the spray of chloride of methyl often gives speedy relief, and ice has been recommended as a local application, but its routine use is not to be advised.

Counter-irritation is sometimes recommended at the commencement of the attack, though it is more useful at a later stage. Sinapisms are lauded, but the writer never used them without finding the pain and discomfort aggravated without any apparent benefits.

Chili paste, or powdered cayenne rubbed up with lard or glycerin, is a favorite counter-irritant, so also is strong acetic acid.

Acupuncture is undoubtedly of great value, and though a painful remedy, it acts sometimes with surprising rapidity. It may be carried out by using the multiple puncture apparatus, or by rapidly inserting a stout needle for about an inch into the affected region, at right angles to the surface, and withdrawing it quickly. A dozen or more punctures may be made on each side of the spine.

Aquapuncture may be carried out in the same way, with the ordinary hypodermic needle, and a little pure water injected each time.

Carbolic acid has been injected instead of the plain water, in some cases, with advantage, and so has nitrite of amyl, in 1 minim doses, dissolved in 10 minims of spirit.

Blisters may be applied in chronic cases, or the actual cautery may be used in the form of Corrigan's iron, lightly and quickly pressed against the skin, so as to cause a very superficial eschar. The thermic hammer may also be used. One of the best methods of treating acute lumbago is to cover over the affected region with a piece of stout brown wrapping paper, and pass slowly and firmly over this a very warm smoothing-iron, such as is used by laundresses, until the patient ceases to be able to tolerate the heat. The writer has seen this to speedily dissipate all the symptoms of pain, stiffness, etc.

Of stimulating or mild counter-irritating liniments there is no end, thus camphor, paraffin oil, turpentine, eucalyptus, rhus, and others are useful.

Electricity is of considerable value in the treatment of lumbago. Occasionally speedy disappearance of all pain has been found to follow the early application of a moderately strong continuous current. It is the rest routine treatment in chronic or recurring cases when combined with massage, and the judicious use of warm bathing at resorts like Bath, Strathpeffer, Baden-Baden, Aix-la-Chapelle, Contrexville, Marienbad, etc.

LUNG, Diseases of—See Phthisis, Emphysema, Pneumonia, Asthma, Hydatids, Bronchitis, etc.

LUNG, Abscess of.

The diet should be of the most sustaining, the surroundings of the patient should be such as will give the best chance of recovery in any wasting pulmonary disease. The same rules for ventilation, pure air, climatic treatment, etc., may be tried in chronic cases as are indicated in phthisis.

The tendency to bring abscesses and cavities in the lung under the dominion of the surgeon is steadily on the increase. Many failures

from operative interference have occurred, and some successes have been reported. There is, however, sufficient progress made to justify fair hopes that the treatment of basilar cavities will become as satisfactory as in the management of empyema.

Various means have been tried; the simplest is to make a free incision through the tissues in the chest wall, resect a portion of one, two, or three ribs, divide the healthy lung tissue slowly by means of the thermo-cautery until the abscess cavity is reached, and after the evacuation of all pus and *débris* to ensure thorough drainage as in a localized empyema. Where there is complete adhesion of the pulmonary and parietal pleuræ the operation is comparatively free from danger, and some authorities secure this by the preliminary application of caustics before performing pneumonotomy. Some few cases have been reported where a large trochar and canula thrust into the abscess cavity between the ribs, has given enough room for the introduction of a sufficiently wide drainage-tube. The most suitable cases are those where the disease is confined to the lower lobe of one lung and where the pleura is adherent. Such cases, whether consisting of simple abscess, gangrenous abscess, or bronchiectasis are easily treated by this simple method. Afterward the cavity can be washed out with warm antiseptic solutions. See also under Empyema.

The aspiration of the abscess or the injection of antiseptics like carbolic acid, creasote, bichloride of mercury, iodoform, etc., into the abscess cavity without previous pneumonotomy, seldom leads to satisfactory results. Internal remedies have little effect, save those which improve the appetite and digestion, lessen fever and reduce hectic. Creasote, in full doses, sometimes does much good by diminishing or retarding the putrefactive changes in the cavity when operative interference is contra-indicated. Volatile antiseptic inhalations or sprays may be useful. See under next article.

LUNG, Gangrene of.

While every means is being employed to keep up the patient's strength and to improve the state of his nutrition, measures should be taken to diminish, as far as possible, the indescribable fetor or stench which surrounds him. This may be attempted by the administration of volatile antiseptics internally, and by the saturation of the surrounding atmosphere with similar agents. Creasote, in doses of 2 to 5 minims, in an emulsion or in capsular form, is the best. Turpentine, myrtol, oil of eucalyptus, or of peppermint, are also useful. Carbolic acid cannot be given internally for any considerable period of time with safety in doses sufficiently large for this purpose. Sulphocarbolates have been found to diminish the abominable odor from the perspiration.

These volatile antiseptics, as they are excreted by the pulmonary or bronchial surface, afford the best chance of modifying the diseased action.

The air of the room may be kept saturated with oil of turpentine. This may be accomplished by periodically pouring some of the oil upon the surface of very hot or boiling water; but the rapid evaporation or vaporization of the turpentine soon ceases, as the temperature of the water falls. The writer's plan is to fill metallic trays or pans half full of dry pine sawdust, upon which the oil is to be freely sprinkled from time to time. A uniform degree of evaporation may be thus obtained. A good method, which he has also tried with satisfactory results, is to make a muslin or gauze coverlet, and fill it with freshly teased out oakum. This may be kept upon the patient's bed, and the oakum can be easily renewed, or sprinkled over with turpentine, eucalyptus oil, or other volatile antiseptic from time to time.

Chloride of lime, bromine, chlorine, sulphurous acid, commercial terebene, sanitas, or any of the innumerable cheap disinfectants may be used for the same purpose. A spray apparatus may be employed to diffuse the disinfectant through the room.

Of local remedies brought to bear upon the gangrenous region, any of the forms of antiseptic inhalations may be employed. Thus, the vapor arising from eucalyptus, menthol, iodine, chlorine, creasote, carbolic acid, etc., may be breathed from any of the ordinary earthenware inhalers. As a rule, however, in an affection like the present, these are worthless. Where a very thorough disinfectant action is required, the volatile ingredient may be poured upon boiling water contained in a large wash basin, as the patient holds his head over it, while a linen sheet is thrown loosely over him, so as to extemporize a tent, under which the concentrated vapor may be freely breathed at intervals of a few hours during the day.

It will not be found practicable to keep the atmosphere of the room impregnated with the vapor of the remedy to such a degree as to affect the secretions at the diseased spot in the lung, else no further inhalations or sprays would be necessary beyond the turpentine or other disinfectant used to purify the air of the patient's chamber. It is thus essential that occasionally the remedies be employed in a more concentrated form, as just mentioned, by steaming under a sheet. In the intervals between these steamings, he breathes day and night the more diluted medicated atmosphere of his room.

Sprays are of considerable use, and are less troublesome, though of less efficacy, than the steaming under a sheet; by their use particles of a solution containing non-volatile ingredients may be projected in a state of minute subdivision, so that they may come into contact with putrefying secretions about the naso-pharynx, larynx, and larger air-tubes. The following solutions may be used as sprays:

Bichloride of mercury, 1 to 2 grains in 10 ounces.
Solutions of chlorinated soda, 1 in 20.
Sulphurous acid, 1 in 20.
Creasote or carbolic acid, 1 drachm in 10 ounces.

Biniodide of mercury, 1 to 2 grains dissolved with potassium iodide, in 10 ounces water.

Creolin, 1 to 2 per cent. solutions in water.

By the use of Coghill's or any other small metallic inhaler, worn for a shorter or longer period during the day, many remedies may be brought into contact with the air-passages. In this way the following substances may be employed: Iodine, creasote, eucalyptus, carbolic acid, iodoform, thymol, menthol, etc.

The following is a good inhaling fluid for sprinkling upon the lint or cotton wool of the inhaler:

℞.—Creasoti purif. ℥iij.
Menthol ℥ij.
Thymol ℥ss.
Spt. vini rect. ad ℥iv.—M.

S.—Use as directed.

The expectoration should be passed directly into a spittoon, containing some powerful disinfectant and deodorizer like turpentine, eucalyptus, chlorinated lime, or permanganate of potassium, in strong solution. It is only by rigid attention to these details that the abominable fetor can be so diminished as to permit the nurse and attendant to approach the patient closely. When the physical signs reveal a gangrenous abscess cavity, the operation of cutting down upon it, performing pneumonotomy with the galvano-cautery or scalpel, evacuating its contents, blowing in a dry antiseptic powder, like boric acid, after washing it out most thoroughly with corrosive sublimate solution, and establishing free drainage, is the best procedure.

LUNG, Hydatids of—See Hydatids.

LUNG, Inflammation of—See Pneumonia.

LUNG, Passive Congestion of—See Treatment under Heart, Valvular Diseases of.

LUNG, Œdema of.

As this is secondary to valvular disease of the heart, or to Bright's disease, or merely as a local result of a general anasarca, its treatment will be detailed under the name of the primary affection.

LUNG, Wounds of.

The less interference in these cases, as a rule, the better; the probing for bullets, etc., or examinations to determine the depth of the wound are unjustifiable. Perfect rest in an easy position with the patient lying upon the wounded side, and where there is much hemorrhage the insertion of good drainage-tube and the dressing of the wound with a

large pad of carbolic gauze, fastened by a moderately tight broad bandage passed round the thorax, is all that is generally required.

Complications as pneumonia, hæmothorax, pleuritis, emphysema, empyema, acute bronchitis, etc., are to be treated upon the principles laid down under their several headings.

LUPUS ERYTHEMATOSUS.

While any departure from the healthy standard is to be carefully sought out and treated upon general principles, every means should be utilized whereby the general nutrition of the body is to be improved, and the general indications in this respect will be those mentioned under Scrofula, Phthisis, etc.

Of internal remedies some have been reported as followed by complete and permanent cure, and the list of constitutional specifics for lupus erythematosus is not a small one. When it is remembered that in a not very small proportion of cases the affection disappears when left to itself, it can be readily seen that the apparent cures probably owe little to the remedy which has been employed.

Of the remedies accredited with curative powers arsenic stands first, and since in small doses it may be given for long periods without doing any harm it may be employed in every case where there are no contra-indications. Some of the highest authorities have reported permanent improvements in a few cases as resulting from its prolonged administration, though the experience of every physician proves how useless it is in the vast majority of typical instances of the disease.

Iodine (free) or iodides of iron, starch, or potassium, iodoform, carbolic acid, phosphorus, minute doses of mercury, ergotine, iron preparations, and last, though perhaps the only valuable member of the group, is cod-liver oil. Indeed, it will be a wise plan if this affection is to receive any chance of improvement from internal remedies to make a rule of giving the drug selected in combination or in conjunction with cod-liver oil. (These remarks apply also to the treatment of true lupus, which is, however, even less likely to be benefited by constitutional remedies.)

The local treatment of lupus erythematosus is a difficult subject in the limited space of a short article like the present, especially as a survey of its literature would almost lead one to conclude that nearly every known inorganic remedy had been recommended for its destruction at some time or other. This is the more remarkable as the affection is a comparatively rare one.

Another inherent difficulty, apart from the extraordinary multiplicity of so-called remedies, is the task of giving a clear idea of the agents indicated at the different stages and variations of the disease without a minute description of these stages, which vary in almost every instance. These remarks apply with more or less truth to the treatment of true lupus also. As stated by Pye-Smith the treatment of erythematous lupus is that of the milder forms of lupus vulgaris,

stimulating applications generally taking the place of destructive measures.

In the early or erythematous stage, soothing lotions or ointments are indicated to relieve congestion and pain. Speaking generally, cases at this period of the disease may receive the treatment most useful in acute eczema. Thus a bland, unirritating ointment, such as the ungt. zinci oxid., to which liq. plumbi subacetat. (1 : 20) is added, or a cream or paste made by rubbing up the oxide of zinc with olive oil, may be smeared over the parts with a brush several times a day. A weak lead lotion (1 : 20), lime-water, or carbolic lotion (1 : 40) may be applied under oiled silk.

In the acute stage, when the disease is active or spreading, and the skin hot and sensitive, most agents do harm. Duhring then recommends the following application with the view of controlling the active hyperæmia :

℞.—Potassii sulphidi gr. v.
Zinci sulphatis gr. v.
Spt. vini rect. ʒss.
Aquæ dest. ʒiv.—M.

S.—To be applied as a wash to the affected parts by dabbing on lightly, for fifteen or twenty minutes, three times a day.

The quantities of the first two ingredients may be increased from 5 to 20 grains as the hyperæmia subsides.

Collodion painted constantly over the part and permitted to dry causes compression of the vessels, and, provided one layer be added before the cracking or peeling of the former one renders its action void, a continuous action may be kept up which, with great care and patience, may prove valuable. It protects the parts from changes of temperature, and, by the compression of the tissue, may promote the absorption of effused products, or starve out the small-celled growth in the connective tissue.

At a later stage stimulating applications may be tried, but in this sometimes a difficulty presents itself, one part of the patch being distinctly erythematous, while the other shows infiltration or scarring. Tarry compounds are very valuable, and, if persisted in at this stage, may give good results. The most suitable is an ointment varying in strength from half to two drachms of the liquor carbonis detergens to 1 ounce of lanolin. When this fails the next best method of treatment will consist in the application of the unguentum hydrargyri, or a 10 per cent. ointment of the oleate of mercury upon lint, which should be kept in contact with the part constantly.

An ointment like the following may be used where there is much redness or irritation present :

℞.—Liq. plumbi subacetat. ℳxxx.
Liq. carb. deterg. ʒj.
Pulv. camphoræ ʒss.
Ungt. aquæ rosæ ℥ij.—M.

S.—To be constantly smeared over the affected area.

Carbolic acid, in the form of an ointment (1 : 10), may be applied, and when at a later stage it is decided to destroy the growth, the acid may be painted on in its purity. Naphthol, chrysophanic or pyrogallic acid, resorcin, strong iodine solutions or ointments, mercurial plaster as strongly recommended by Kaposi, green or soft soap, sulphur ointment, iodine as tincture, ointment, or glycerin, Fowler's solution brushed on daily, or 10 per cent. ichthyol ointment, may be tried.

Where absorbent or stimulating applications fail, and the disease continues to progress, the destruction of the new growth by stronger remedies is to be seriously considered, and much caution and some skill is requisite in carrying out this in order to prevent such a free destruction of tissue as may result in a more unsightly appearance than if the affection was left to itself.

Any of the caustics recommended for the destruction of tissue in lupus vulgaris may be tried. Thus creasote, salicylic, carbolic, acetic, or lactic acids, chloride of zinc, solid nitrate of silver, permanganate of potassium, corrosive sublimate, nitrate of mercury solution, or surgical procedure with the spoon, cautery, or galvano-cautery may be resorted to.

The safest and least disfiguring method of treatment is that by linear multiple incisions or scarifications made by a suitable instrument. With great care these incisions may be made with the point of a fine, very sharp scalpel or tenotomy knife, so as to leave the healthy skin untouched, as practised by Shoemaker. The object of these minute incisions or punctures is to cause destruction of new vessels, and so starve out the growth and cause its absorption. The punctures should not exceed one-fifth inch in depth, and they should be as close together as possible.

LUPUS VULGARIS.

The same advice regarding the treatment of any diseased organs and the management of any deviations from the standard of health, as given under Lupus Erythematosus, may be followed.

As for constitutional remedies or internal specifics, there are none. Nevertheless, the same drugs which have been supposed to exert a specific action in the erythematous variety of lupus may receive a fair trial. These are cod-liver oil, arsenic, phosphorus, iodine, iodoform, mercury in very small doses, and the various preparations of iron.

Hutchinson lays great stress upon the importance of constitutional treatment directed to improving the general health, and to the necessity of protecting the seat of the disease from cold and damp in winter. He

therefore recommends the lupus patient to keep in warm rooms in the winter, or to change his residence so as to enjoy perpetual summer. To the writer it seems that much may be expected by the exhibition of improved hygienic agents, which are likely to put the tissues in a better position for permitting phagocytosis—Nature's remedy—to take place. (See under Tuberculosis.)

Local treatment is varied by each specialist who has his favorite remedy. Before ulceration has set in some recommend soothing applications, as zinc ointment, lead lotions, etc., as in the erythematous variety, but no hope need be indulged in that such measures can do anything but give very temporary relief. They are necessary, however, in various stages of the advanced disease, in order to subdue the smarting and congestion which hover about the circumferential zone of the affected patches.

Various remedial agents have been used with the view of stimulating the unulcerated spots, so as to promote absorption without injuring the skin. Failure is the general result, though in many cases the disease may be checked or held at bay by this means for considerable periods.

Vidal rubs in the oil of anacardium. The ointment, oleate, or plaster of mercury, iodine applications, tar ointments, and the various stimulating applications mentioned under lupus erythematosus have been tried. Ice applied for two or three hours daily has been used with the view of killing the bacillus, which is now demonstrated to be the cause of the disease.

Where ulceration has taken place there is little use in wasting time with treatment which at the best can only be palliative. The new growth must be effectually destroyed, and tubercles or nodules escaping the destructive process act as infective centres and cause return of the disease.

The depth, extent, rate of progress, duration, and situation of the diseased action will require different modifications in the various methods by which the destruction is to be accomplished.

Great activity, apart from the trial of Koch's lymph, has been evidenced in this little corner of the therapeutic field of late, and the result has been the introduction of quite a number of methods, for which is claimed that by their use the diseased elements of the skin are effectually destroyed without the least injury to the healthy constituents of this tissue. The great object being the destruction of the diseased cell-growth, this can be more easily, rapidly, and certainly accomplished by surgical methods; but as the chief site of the affection is upon the face, the nature and extent of the resulting scar is a matter of the greatest moment to the patient. Hence any agent which will select out the new growth and accomplish its annihilation with the minimum loss of healthy tissue will be of the greatest value, even though the process be a tedious one. These agents are, however, sometimes uncertain in their action, especially where the disease is extensive; but they are often very successful in dealing with small

patches, and, though the operator need not expect to get the speedy and complete triumph which a perusal of the recent literature of lupus would lead him to believe is awaiting a trial of these remedies upon the first case which he meets, nevertheless, in the great majority of instances, ultimate success will follow a steady persevering application of most of the members of this class.

The most typical member of the group is salicylic acid. It is best used as a paste, which can be made by rubbing up the pure acid with creasote in about equal proportions. Where an extensive ulcerated surface upon the face is to be operated upon with this paste, the ulcers should be previously freely brushed over or covered with a piece of lint soaked in a strong solution of cocaine (10 to 20 per cent.). The paste can then be applied daily until a raw granulating surface is seen to occupy each spot where tubercles or ulcers had formerly flourished.

Unna's "plaster mulls," containing salicylic acid and creasote, are much more elegant and efficacious agents. The ointment form is preferred. The following is a good formula; it should be spread on lint and covered with gutta-percha: Creasote, 2 drachms; salicylic acid, 1 drachm; and simple ointment, 2 drachms.

No rule can be laid down for the number of applications. The physician should not begin the treatment unless he has made up his mind to the trouble and slowness of the process. The writer has seen a considerable patch treated by this method get perfectly healed up inside three months. Whatever objections may be made upon the score of delay are often answered by the slight and satisfactory nature of the resulting scar. As will be mentioned later on, this paste is of unquestionable value in very obstinate cases, when applied after surgical measures have been employed to remove the diseased tissue in bulk.

Lactic acid is another remedy which there is good reason for believing may cause destruction of the diseased cell growth without injuring the healthy skin. The *concentrated* acid only should be used, and, owing to its thick, syrupy consistence, there is not any great difficulty in limiting its action to a particular spot. The writer has used it a considerable number of times, and can to a certain degree corroborate the statement made by Hortmann, who says: "It seeks out the diseased tissue—as a dog does game—surely finds it and effectually destroys it;" but occasionally, perhaps, when the game is scarce, it appears to prey, in the writer's opinion, upon the margin of the healthy skin, and hence it requires some watching.

It may be used in various forms, and that of a paste, consisting of about equal quantities of the syrupy acid and kaolin, is the method most recommended. It is also painted on with a brush or injected hypodermically (1 : 2) into the tissue in the diseased area. The simplest method by far which the writer devises, and from which he has never seen any ill effects, is the following: After previous poulticing and ablution, paint the ulcerated surface over with a 15 per cent.

cocaine solution several times before applying the acid, and wipe it quite dry with absorbent wool immediately before the acid is brought into contact with it. Make a little map of the ulcerated surface, so as to cut out neatly and accurately a folded piece of lint (two plies) of the same size and shape as the patch. These should be soaked for some minutes in the pure concentrated acid placed in a saucer, the surplus acid being very gently removed by the least squeezing out. The double layer of lint may be accurately applied to the diseased surface by means of dressing forceps.

The margins of healthy skin may be smeared over with any firm cerate to prevent the acid trickling over the face. The pain is often severe, and lasts some hours. The lint may be covered with oiled silk, but the writer does not do so. He applies some more acid to it with a brush after a few hours, without disturbing its position. It may be left in contact for about four hours. Authorities differ, some directing an application of fifteen minutes, and others recommending one of ten hours, after which spirit lotion on lint may be applied under oiled silk. The number of applications required in any given case can only be determined by the effect. After three or four days the surface should be very minutely examined, and any suspicious portions subjected from time to time to the action of the acid, applied upon little circular islands of lint for six, eight, or ten hours. The treatment will extend over several weeks or months, and as parts of the original patch become entirely healed, others probably may be discovered in which the diseased action is in full swing. Thus destruction and repair will be carried on at the same time in different regions of the same patch.

It will thus be seen that the management of true lupus by this method is most tedious, and makes severe demands upon the time and patience of the physician, but just as he begins to feel that he or the patient may be carried off by old age or some concurrent malady before the diseased patch has been all replaced by healthy, transparent cicatricial tissue, he will probably be rewarded with a clean, smooth scar, showing no vestige of "apple-jelly" blossoms, and presenting the minimum of deformity.

Pyrogallic acid is stated to possess some selective affinity for the new growth, and is applied in the form of an ointment (1 : 8), as a plaster (1 : 5), or brushed on as a saturated solution in ether; but its destructive powers are by no means so easily controlled as those of salicylic or lactic acids.

Arsenic, applied *in the form of Fowler's solution*, is stated to cause the destruction of the new growth without injury to healthy skin. It should be applied daily until it causes severe inflammatory swelling, when its use is to be suspended for a time. Heller employs this method of dealing with both true and erythematous lupus, and speaks highly of the results. Arsenic in more concentrated form is also used as a caustic, as will be presently mentioned. Some specialists have reported very

favorably of the injection of Fowler's solution into the diseased region and its margins.

Hydroxylamin, a powerful reducing agent, has been successfully used as a local remedy in lupus, beginning with an alcoholic solution (1 : 1000) painted over the cleansed ulcers four times a day. Eichhoff increases the strength of the solution gradually until double or treble the above percentage is used, without producing secondary inflammation.

Peru balsam is recommended as a local application twice a day in very mild cases, and as a preliminary measure in severe cases requiring surgical operation.

Caustics or corrosives are employed in the treatment of lupus with the view of causing the destruction of the diseased tissue in bulk. Nearly every known chemical substance capable of accomplishing the death of healthy tissue has been used for this purpose. Nevertheless, this method of treatment will probably soon cease to be practised, owing to the difficulties in limiting the destructive action to the diseased area. From their use speedy and radical cure of the disease may be obtained, but the scars are often most unsightly. If too little depth of tissue be destroyed, the resulting useless irritation may hasten the growth of the new cell formation, and cause the roots of the disease to strike deeper into the soil. If too much or too great a depth of tissue be removed, the resulting scar will be proportionate. The only way in which these remedies can be safely used is by the specialist, who, confining himself to the employment of one or two members of the group, will soon acquire a thorough and complete mastery over his weapon when directed against the endless variations of lupoid growths. It is surprising to see how satisfactory are the results obtained upon this principle by quacks, who confine their attention and practice to the removal of epithelial and other cancers and lupus, though it must be remembered that pride and other motives tempt their patients to hide the failures.

The recent improvements in the surgical or mechanical methods of treating lupus will still more likely cause this group of remedies to fall into disuse, or to be merely confined to the superficial layer of tissue left after the knife or cautery.

Kaposi applies for twenty-four hours a paste composed of chloride of zinc and butter of antimony in equal quantities, with half as much strong hydrochloric acid, mixed with the same amount of liquorice powder. The following are also used, viz. :

Vienna paste, made by mixing caustic potash with rather more than its own weight of water, and adding a little rectified spirit.

London paste, made by mixing caustic soda with an equal weight of recently burned lime, and adding a sufficient amount of rectified spirit.

Hebra's paste of arsenic, composed of—

℞.—Acid. arsenios. gr. xv.
Hydrarg. sulph. rub. gr. xlv.
Unguent. cetacei ℥vj.—M.

S.—To be used as directed.

Iodine paste or cream, prepared by triturating equal quantities of pure metallic iodine and tincture of iodine together, and adding to the mixture an equal amount of glycerin.

Nitrate of silver is still often used. It was a favorite remedy of Hebra. It may be used as a solution (60 grains to 1 ounce), or as the solid stick which is better. This may be thrust into the papular or tubercular elevations, and though terribly painful, is very efficacious when thoroughly and persistently applied. The pointed stick of caustic may be thrust into each lupus nodule after puncturing it with a lancet.

Acid nitrate of mercury is an excellent and manageable caustic which the writer has used always with great satisfaction when the disease is very superficial, and limited in extent. It may be applied daily upon cotton wool twisted around a probe, or by means of a brush.

Carbolic acid, the solid acid liquefied by heat, may be applied every day after drying of the surface; its action is, however, very superficial, and in many cases it does not reach the diseased stratum at all. Sprays of various strengths of the drug have been used, but with very poor results.

Nitric acid, in concentrated form, may be tried by means of a glass brush or wooden spatula, but it is open to the same objections as the last-mentioned agent.

Permanganate of potassium, in solution (1 : 10), may be painted daily until the nodules are destroyed.

Chromic acid has been recommended, but it is a treacherous caustic for the face. It may be used when the mucous membrane has become affected.

Iodide of sulphur (1 drachm to 1 ounce), in the form of ointment, is recommended, but it produces pain and inflammation out of proportion to the good which it does,

Ethylate of sodium solution is an excellent caustic where there is little tissue calling for destruction. The B. P. solution may be daily brushed over the diseased patch (which should be dried with blotting-paper), by means of a glass brush until a scab forms, which falls off in a few days, after which the applications are to be renewed. If pain is severe, a drop of chloroform may be applied. This converts the ethylate into ether and chloride of sodium. The scarring is comparatively slight.

Bichloride of mercury has been used in various forms and in solutions of various strengths, from the 2 grains per ounce, which is rubbed on with the view of preventing the growth of the bacilli, to the 20 grains per ounce solution in alcohol, which is employed with

the view of destroying the tissue. Unna's method of using this agent as an auxiliary to treatment by surgical or salicylic processes, is a very important step in the problem of treating lupus. After dealing with the disease in bulk by the more radical measures, it is found that scattered nodules, about the margin of the sore, remain undestroyed, and give much trouble. For these the following solution is recommended:

℞.—Hydrarg. bichlor. ʒj.
Creasoti purif. ʒss.
Alcoholis purif. ad ʒiij.—M.

S.—To be used as directed.

At each sitting, about ten lupus marginal nodules are to be selected for destruction. By a fine acne lancet each is punctured, and the above solution applied on a little absorbent wool, mounted upon a bit of match-wood. The moistened wool should be thrust down deeply into the punctured nodule and left *in situ* for fifteen or twenty minutes after the wood is withdrawn. In a few days the punctured wound and lupus nodule have disappeared. The process is a slow one, but if a different region of the face be operated upon every day it is surprising how soon these scattered nodules may be cleared away.

In a similar manner, iodine in solution has been injected for this purpose by a fine syringe into the nodules. Twenty grains of iodine are dissolved in 1 ounce of glycerin.

Shoemaker has caused the destruction of the diseased tissue by establishing the jequirity inflammation, and Townsend has produced a similar result by the application of Alveloz. Both these methods are open to serious objections, the chief of which is the difficulty in limiting or circumscribing their action when once it has been set going; and, moreover, they may leave as a legacy, even when successful, deep and unsightly scars and deformities.

As preliminary to operative measures, and in some cases as a substitute for them, Brooke recommends the slow, prolonged, steady friction of an ointment consisting of 15 grains of salicylic acid, 15 grains of ichthyol, and 1 ounce of oleate of mercury (2½ to 5 per cent.).

The mechanical or surgical methods of treating lupus afford the most rapid and thorough results, but the scar is often more disfiguring than that left by lactic acid or by the paste of salicylic acid and creasote. With moderate care, however, the scars need not be more extensive than those produced by these remedies. Mechanical treatment, moreover, is the only available method left in very severe cases, and since the deformity can be minimized by various procedures in the after-treatment, this method gives, upon the whole, the most satisfactory results, and is daily becoming more thoroughly recognized as *the* treatment for lupus vulgaris.

The mechanical methods consist of:

1. Multiple puncturing or scarification.
2. Scraping or curetting by Volkmann's spoon, or the sharp curette.
3. The thermo-cautery of Paquelin.
4. The galvano-cautery, or the actual cautery.
5. The destruction of the tissue by Morris's double-screw, or a dentist's burr.
6. Excision of the diseased tissue by the knife.
7. Any of these methods combined.
8. Any of these methods followed immediately afterward by caustics.
9. The process of electrolysis, originally introduced by Gärtner and Lustgarten. This method has never obtained the full trial which it merits. In the hands of Jackson it has given good results. He uses a button electrode for large surfaces, and a course sewing needle for small ones, and the strength of the current in the former case is seven milliampères, and in the latter about three. He reports that the electrolytic action of the current seems to expend itself only upon the diseased tissue.

The most satisfactory and radical of all these procedures is carried out by chloroforming the patient and scraping the diseased surface with Volkmann's spoon until a healthy layer, free from all lupoi l nodules, is reached. Unna prefers Paquelin's cautery to the spoon foi this purpose.

Before the influence of the anæsthetic has passed off, the scraped or burned surface is rubbed with the following solution—*i. e.*, carbolic acid, 1 drachm; bichloride of mercury, 1 scruple; spirit of ether, 1 ounce. A plaster containing 20 grammes of salicylic acid and 40 grammes of creasote, or guaiacol 10 grammes and salicylic acid 20 grammes per one-fifth part of a square metre, is applied, and covered over with glycerin jelly and cotton wool.

In twenty-four hours Unna removes the dressing, cleanses the surface, paints with cocaine, and rubs or bores all suspicious-looking spots with a 10 per cent. sublimate pencil, and redresses with the plaster. Where the plaster is not obtainable and where chloroform cannot be given, and where the knife or cautery is objected to, he resorts to the chemical method, and applies in the first instance a strong ointment of 1 part salicylic acid, 2 parts creasote, and 2 parts simple ointment. The strength of the plasters and ointment should decrease as the treatment progresses.

Schütz attaches great importance to the free application of collodion over the dressings in order to cause compression upon the granulations and prevent retraction of cicatricial tissue, so as to leave the best possible scar. Lassar also lays great stress upon the constant inspection of the wound and the repression of granulation tissue until a genuine epidermic formation is established.

Hebra's new dressing may be applied after the destruction of the

growth. He has also obtained good results from its use where no scraping or other operation has been performed. It is known as "creasote salicylic glycerinum saponatum," and contains 5 per cent. of creasote, 5 per cent. of salicylic acid, and 90 per cent. of glycerinum saponatum. (See page 231.)

Eichhoff extols the use of aristol as a dressing. It is a derivative of thymol, and, while more active than iodoform, is is perfectly harmless and odorless.

Barling advises, when possible, the excision of the diseased tissue, including the entire depth of the skin and its subcutaneous fatty layer, and the repair of the breach by a plastic operation. Skin-grafting has given good results in such cases. Excision is certainly the most satisfactory of all treatments when the lupus is not upon the face, but upon some part of the body covered by the dress.

The treatment of lupus by Koch's lymph has recently attracted the deepest interest, and at the present moment the most eminent authorities deny that a single absolute cure has been seen. Nevertheless, it is highly probable that, combined with surgical procedures—scraping, etc.—a very distinct advance in the treatment of this disease will be established. (See under Tuberculosis for full details of Koch's plan and for suggestions from the writer for a new method of using the agent.)

The hypodermic injection of dog's serum, as recommended by Professor Richet, has already given excellent results, which the writer has witnessed in the wards of Professor Fournier, but the permanence of the effects is not yet established.

LYMPHADENITIS.

In simple acute inflammation of lymphatic glands occurring in healthy individuals, the first indication is to treat the cause. As this in most instances will be found to be the absorption of some septic product originating in a wound or abrasion upon the distal side of the gland, the condition of the wound or focus of infection will require attention. Antiseptic dressings should be applied under oiled silk, and if any pus has formed in its immediate vicinity it should be at once evacuated. As there is generally acute inflammation (lymphangitis) of the lymphatic vessels between the wound and the inflamed gland, the band or strip of skin should be painted over with the tincture of iodine, which often acts like a charm in reducing the lymphatic irritation. Rest to all the parts (muscles, joints, etc.) in the neighborhood of the inflamed gland must be secured.

The constitutional treatment should be directed to the reduction of fever and relief of pain, a smart saline purgative, followed by small doses of aconite, and a milk or fever diet being administered. In septic cases, or those following poisoned wounds, a liberal nutritious diet, with alcoholic stimulants and concentrated beef extracts or soups

may be commenced as soon as the first acute symptoms have been combated. Basham's mixture, or large doses of the tincture of iron, alternating with full doses of quinine, afford the best internal treatment.

The following may be given with advantage:

℞.—Sodii sulphocarb. ʒij.
Glycerini ℥ss.
Tinct. aurantii amar. ℥ss.
Aquæ camph. ad ℥vj.—M.

S.—One tablespoonful to be taken in two tablespoonfuls of water every three hours.

Local treatment should consist in measures likely to relieve tension and check inflammatory action in the gland.

Cold or hot applications have each their advocates, and the same result—*i. e.*, resolution without suppuration—may be secured by both. By ice, evaporating lotions, cold compresses, or Leiter's tubes the tension and arterial supply are soon markedly lessened, and the inflammation as evidenced by pain, heat, redness, and swelling soon diminishes or disappears. When hot or warm compresses or poultices are applied, as shown by Brunton, the capillaries of the collateral circulation are dilated and the current is diverted from the inflamed vessels. Up to a certain point both methods of treatment tend to prevent suppuration; and the writer has satisfied himself that, contrary to the popular notion, warm poultices prevent suppuration by reducing the tension of an inflamed gland if applied at an early stage, the general relaxation of the tissues sometimes speedily relieving the tension which is fatal to the life of the organ.

At a later stage, by keeping up a continuous moist warmth and making the part an internal one, poultices hasten the pointing of the abscess.

Nasiloff treats inflamed glands by using compresses at a very high temperature. He drops several piles of linen into boiling water, squeezes them out quickly, and applies them directly over the inflamed gland and envelopes the part for fifteen minutes in a thick pad of cotton wool.

The best guide to the selection of hot or cold applications is the sensation of comfort or pain produced, the applications from which the patient derives the greatest ease being always preferred.

Spirit lotion (1 : 3) applied upon lint and covered with oiled silk is one of the best possible local applications. If gently warmed before coming into contact with the skin, and if a thick layer of cotton wool be lightly bandaged upon the top of the oiled silk, an antiseptic poultice of the highest merit is thus obtained.

Various abortive treatments are employed, with the view of cutting short the inflammation and preventing suppuration, and several

counter-irritants are recommended for this purpose. The writer has obtained most satisfactory results from freely painting the skin over the inflamed gland with iodized phenol (1 ounce iodine rubbed up with 4 ounces of warm carbolic acid). Solid nitrate of silver is rubbed upon the previously moistened skin by some, others brush over a strong solution of it.

Iodine, carbolic acid, collodion, bichloride or nitrate of mercury solution, and other substances, are painted over the integument under which the infected gland lies. Blistering is also resorted to; but it is most objectionable in acute cases. It has been tried to prevent suppuration by injecting a few drops of liquid carbolic acid into the inflamed gland.

Rubbing in of liniments or friction in any form is almost certain to determine the formation of matter. The actual or Paquelin's cautery lightly passed over the skin occasionally appears to retard or prevent suppuration. (See also under Bubo and Boils.)

When pus has evidently formed in the gland its speedy evacuation should be accomplished. Aspiration is worse than useless, and the plan of making a punctured wound and squeezing out the matter is objectionable.

The old-fashioned free incision is the best, and unless there be much pain and increased tension a poultice had better not be applied. Warm spirit lotion under oiled silk is a comfortable antiseptic for small abscesses of this sort.

In the majority of instances the free incision does away with the necessity of a drainage-tube. A small wound is of much advantage if the scar is visible, and where the adenitis follows some irritation about the jaws the incision should be as limited as possible, compatible with evacuation, and a fine drainage-tube or a few shreds of carbolized tow or horse-hair will establish the removal of all pus as it is secreted. (See under Abscess for the various recent methods of dealing with local collections of pus.) After the free removal of pus and the application of spirit lotion under oiled silk, the cavity may be syringed out with weak sublimate solution (1 : 3000) from time to time as it heals up from the bottom.

In chronic cases it is equally necessary to find out and treat the primary focus of infection, after which the gland enlargement, if pus has not formed already, may be subjected to mild counter-irritation or friction with a stimulating absorbent. The tincture of iodine is often of some service; but the writer uses the lin. potas. iod. cum sapone, B. P. Belladonna plaster or the iodide of lead plaster may be applied over the tumor. Where the enlargement remains, and suppuration does not take place, this latter result may be brought about by the injection of various irritants, when to allow the gland to remain in its enlarged condition would be to keep up an eye-sore. Carbolic acid, iodine, acetic acid, chlorides of iron, and mercury, etc., have been injected.

Treves in such cases thrusts the finest point of the thermo-cautery through the skin, and moves it about inside the gland, in order to break up and cause disintegration of its tissue, after which he inserts a fine drainage-tube and applies poultices.

Sinuses should be slit up and scraped, and permitted to heal from the bottom, and where glands cannot be reduced in size by the above treatment, or where the suppurative process only destroys a portion of their tissue, they may be carefully dissected out. The writer successfully dissected out a mass of chronically enlarged glands below the groin, in the interior of which a large calcareous deposit had formed, and which had been supposed for years to be a case of disease of the upper end of the femur. A probe passed into any of the numerous sinuses always struck on what felt like diseased bone. Rapid healing, with trivial cicatrix, resulted.

Scrofulous affection of lymphatic glands will be mentioned under Scrofula.

LYMPHADENOMA.

The only treatment for a simple hypertrophy of solitary lymphatic glands is removal by the knife. Considering that there is good ground for believing that a solitary adenoma may be the starting point of the disease, known as Hodgkin's Disease, the early removal of the growth is strongly indicated when there is no reason to believe that it is of a purely scrofulous nature. Even when several contiguous glands are markedly enlarged without any increase in the size of the lymphatic glands throughout the body and without splenic disease, and in the absence of considerable increase of white corpuscles in the blood, the operation should not long be delayed.

When the constitutional features of the mischief, known as non-leukæmic lymphadenoma or Hodgkin's Disease, have become established, extirpation of the tumors is much worse than useless. All that can be hoped in such cases is that by attention to health through improved feeding, change of residence to a healthy seaside resort, and the employment of every means by which digestion and appetite can be improved, that the disease may be retarded in its progress by the administration of special remedies.

Arsenic in very large doses has been found in some isolated cases to cause disappearance of the glandular enlargements and restoration to health. This occurred in one patient under the care of Billroth. Many observers have, however, reported that marked improvement for a time has followed the use of arsenic, and sometimes there is good ground for believing that the invariably fatal progress of the malady has been held in check for considerable periods by its steady administration. It may be given in combination with iron, for although this drug appears to have no effect upon the anæmia present in the fully established disease, it appears to materially increase the beneficial action of arsenic. Fowler's solution should be commenced in doses of 5 minims, and in-

creased until 15 minims, three or four times a day, are administered immediately after food. Larger doses have been given without producing any ill effects. The remedy has been injected with a fine needle into the enlarged glands, but it is doubtful if this is of any use. Where it causes irritation in the stomach and bowels, the hypodermic method of injecting 5 minims diluted with one or two drachms of water into the areolar tissue may be resorted to.

The other remedies believed to be of some use in this disease are phosphorus, iodide of potassium, and cod-liver oil. Where arsenic and iron cannot be well tolerated or when they fail, phosphorus may be tried in conjunction with cod-liver oil. The phosphide of zinc has been resorted to by Reclus and others with some apparent benefit, but as arsenic had been always previously employed in the cases reported, it may have been the cause of the temporary improvement. Mercury should not be given. Of local remedies or methods all have proved unsatisfactory. The excision of the glandular tumors and the injection of arsenic into them have been already referred to as highly unsatisfactory, the same may be said of galvano-puncture, the injection of carbolic acid, iodine, chromic acid, and various other irritants.

LYMPHANGITIS OR ANGEIOLEUCITIS.

Where the chief trouble appears to be centred in the lymphatic vessels the same principles are to be recognized in the management of the case, as have already been detailed in speaking of the treatment of inflamed lymphatic glands under Lymphadentitis. Thus attention should be at once directed to any injury or wound which has been the starting point of the affection. This should be treated by antiseptic poultices (spirit or carbolic lotion, under oiled silk), and the free evacuation of any collections of pus by proper incisions. Where the lymphangitis is superficial, and the red, tender, painful, and swollen lymphatic vessels can be discerned extending from the wound in the direction of the lymphatic glands, the greatest good can be got by painting over the inflamed area with the tincture of iodine, and prescribing absolute rest to the affected limb.

In six or eight hours an evaporating lotion or a warm spirit lotion may be applied. Where tension and pain are prominent, a large hot poultice may afford relief and even diminish the chance of suppuration. Pus should be evacuated as soon as it is found to be present, and antiseptic dressings applied warm.

Saline purgatives, iron, quinine, and stimulants, with pure air and wholesome plain food such as milk and eggs, in abundance, are all that are generally found needful.

MALARIA—See Intermittent Fever.

MALIGNANT DISEASE—See Cancer.

MALIGNANT PUSTULE OR WOOLSORTERS' DISEASE.

In the *external* form of the disease, as soon as the nature of the local eschar justifies a decided diagnosis, active surgical treatment should be commenced without delay. This consists in the removal or destruction of the eschar or so-called pustule, and the success of the procedure in preventing or minimising constitutional infection depends upon its early and prompt adoption. After excising the diseased tissue with a sharp scalpel, the galvano-cautery should be applied freely to the wound.

Where the pustule is very small, it may be treated as a carbuncle, by making a free crucial incision, and applying a strong caustic-like potassa fussa, chloride of zinc, strong nitric acid, or nitrate of mercury. Some authorities inject tincture of iodine or strong carbolic acid into the centre of the eschar, and into the tissues around its base.

There cannot be any question of the relative merits of these operations. The complete excision by the knife and the after-application of the cautery should always be preferred, even when the constitutional symptoms have become well marked. The wound may receive one or two dressings with a paste made by rubbing up quinine with spirit of turpentine. The paste has been used by Rivas with success in several cases as a local method of dealing with the eschar without previous excision.

Where there is constitutional disturbance, showing that general inoculation has already occurred, or whore the *internal* form of the disease is present without any eschar, the treatment must be as supporting as possible. Concentrated beef essences and highly nutritious soups or strong beef or mutton broth, and free stimulation should be resorted to from the beginning. Quinine, sulphocarbolates, sulphites, carbolic acid, salicylates, and large doses of the chloride of iron in combination with mindererus spirit, may be given. Where pulmonary mischief has resulted from direct inhalation of the poison without eschars, the best chance will be given by surrounding the patient with an atmosphere saturated with eucalyptus, carbolic acid, or turpentine. The various complications, as pleuritic effusion, œdema of the glottis, hemorrhages, etc., must be dealt with upon ordinary therapeutic principles.

MAMMARY GLAND, Inflammation of, or MASTITIS.

Preventive treatment directed to the nipple (see Nipple) during the latter days of pregnancy and after delivery materially diminishes the chance of mastitis. Where the gland becomes swollen and painful, *rest* is the first indication. This is obtained by keeping the patient upon her back, with the breast supported by a sling or broad bandage passed under the dependent gland and over the opposite shoulder. The arm should be kept close to the side, but, as a rule, this can be managed by the patient without bandaging. The question of putting the infant to the swollen gland can only be decided by experiment. It

is, upon the whole, better to give the nipple rest where the process of suckling is very painful, and indeed in any case, where the breast-pump works satisfactorily, and removes the accumulated secretion without pain, the child should be nursed by the sound breast from the beginning.

The decision of weaning should not be too hastily arrived at, as the case may, under judicious treatment, resolve, and the infant should not be deprived of its natural nourishment, but in this matter the judgment of the physician is of great importance, and, unfortunately, it is not a very rare event to witness an infant tugging at a breast, the seat of extensive suppuration, from the nipple of which pus may be sucked, with pain to the mother and injury to the child.

At the beginning of the mastitis, if coming under the physician's notice at this stage, the question of cold or hot applications has to be decided. As a rule, it may be said that cold applications are not well borne, and do not give satisfactory results, and their use should not be persisted in if a speedy diminution of the pain, heat, redness, and swelling does not occur. The best cold application is the ice-bag. Its use is often persisted in under the misapprehension that warm applications tend to determine suppuration, but, as already mentioned under lymphadenitis and elsewhere, it has been pointed out that warm or hot applications, by relaxing the tissues and diminishing the pressure, often relieve the tension, which is more or less fatal to the life or integrity of the part affected.

If, then, the ice-bag or cold evaporating lotions are not soon followed by relief of pain and diminution of the tension of the breast, they should be discarded for moist and warm or moderately hot applications. Of all the forms of applying moist warmth to an inflamed breast, the writer finds none so convenient and satisfactory as the following:

A shallow wooden bowl or basin, after the fashion of a small butter-dish, large enough to more than cover the swollen gland, is to be procured. After stuping the breast with hot flannel cloths, a piece of cotton wool or soft flannel squeezed out of hot water is to be laid in the inside of the wooden basin, which is then inverted upon the breast. If the basin is of the proper size a most soothing and comfortable moist warmth can be maintained for hours. Several layers of lint soaked in warm spirit lotion (1 : 2) may be used instead, and covered in by a piece of oiled silk, in these ways all the advantages of a poultice without many of its drawbacks may be obtained.

A favorite application is belladonna, and occasionally the physician may be rewarded by hearing that it gives some relief. The stereotyped formula of the green extract rubbed into a thin paste or cream with glycerin is the one generally employed. It is, however, inconvenient and filthy, and very often fails. Where the therapeutic action of belladonna is desired a little of the liniment (which is almost colorless) may be added to the warm spirit lotion, care being taken that the child, if put to the breast, does not get any of it.

The following formula may be used with advantage in many cases where the skin is unbroken :

℞.—Lin. belladonnæ ℥iv.
Tinct. aconiti ℥ij.
Spt. vini rect. ℥iv.
Aquæ rosæ ad ℥xij.—M.

S.—The lotion to be applied to the inflamed breast upon lint, and covered with oiled silk.

Such a warm moist application need not be changed oftener than every eight hours if a large thick pad of warm cotton wool be laid on over the oiled silk, and retained in position with a light broad bandage passed over the opposite shoulder. The extract with glycerin smeared over the surface of a warm poultice often affords relief. It is a good rule not to use any belladonna preparation to a breast to which the child is to be afterward placed.

Arnica, sal ammoniac, jaborandi, digitalis, chloral, laudanum, stramonium, hemlock, marshmallow, tobacco, hyoscyamus, and many other substances have been used; but, as a rule, moist warmth accomplishes everything, and much more than these. Where a poultice is used the writer has found great satisfaction in smearing over its surface with the ointment of conium. This often gives better results than belladonna.

While local measures are being used much may be done to allay the constitutional disturbance with minute doses of aconite or tartar emetic, combined with a diuretic; but the chief indication is to check for a time the abundant supply of milk. This is best accomplished by a diet in which there is as little liquid element as is compatible with the patient's comfort, and at the same time the bowels should be frequently purged by the administration of small doses of saline cathartics, the best of which for this purpose is teaspoonful doses of sulphate of magnesia, or tablespoonful doses of Rochelle salts dissolved in lemonade.

At this stage nurses are very fond of friction or massage upon their own account, and every physician can recall cases where mammary abscess has been the direct result of unwise manipulation of the gland. Nevertheless, friction judicially and skilfully applied will be found to be a powerful remedy for good, especially in those cases where the breast-pump or infant causes much pain to the fissured or ulcerated nipple. Friction when roughly applied is very liable to determine suppuration, and, consequently, the physician should at first carry out its application himself. It should be gentle and almost painless, and the pressure should be commenced at the periphery or circumference of the breast, and should be applied in lines converging toward the nipple, and a little oil or camphor liniment may be smeared over the skin before commencing the operation.

In this way a very painful and engorged breast following upon, and directly caused by, a fissured nipple may be relieved of the tension

resulting from retained secretion, and thus the dangers of suppuration may be avoided; but where gentle friction, applied in lines from the circumference to the centre, causes severe pain without relieving the tension of the breast, its continuance should not be advised. The other measures recommended should then be resorted to again, viz., moist warmth, gentle pressure by a bandage, regulation of the diet, and free purgation. Iodide of potassium in large doses with belladonna internally and a little morphine will diminish the secretion.

Recently, excellent results have been obtained without poultices or warm fomentations simply by the application of *elastic pressure*, and this, when it succeeds in giving relief as soon as it is applied, may be used as the only local treatment. Where there is much pain and tenderness Horne applies a 5 per cent. oleate of mercury and morphine solution, over which is placed a thick layer of cotton wool enveloping the entire breast. Upon the top of the wool an elastic woven or pure rubber bandage may be so applied as to exercise a comfortable elastic pressure, by passing it round the chest and over the opposite shoulder until the inflamed gland is evenly covered. One great advantage which this method produces over all others lies in the fact that the patient may freely move about without interfering with the *rest* of the inflamed organ. The child can drink at the sound breast until the inflammatory action subsides in the affected one, after which it may be able to take its share in the work of nursing. Galvanism has been tried, but the results are unsatisfactory.

No treatment will be based upon truly scientific principles which omits to deal with the almost invariable cause of the mastitis—*i. e.*, ulceration, abrasion, or fissure of the nipple. There is little doubt but various germs gain admission to the ducts in this way.

When, notwithstanding the employment of these various remedies, it becomes evident that pus has formed, either upon the surface of the gland, in its substance, or in the areolar tissue behind it, its early evacuation by a free incision will be the first thing that will give relief. When, however, there is no sign of pointing, hot poultices or very warm fomentations may be continued until the matter shows some signs of the route by which it intends to reach the surface, after which, under the ether spray, an incision should be made at the most dependent part to insure thorough drainage, and if considered necessary, a small drainage-tube may be inserted under antiseptic conditions, and the abscess cavity may be occasionally syringed with weak carbolic, corrosive sublimate, or boric acid solution. In making the incision it is advisable to keep clear of the nipple lest it should become involved in the cicatrix, and by suffering retraction afford a barrier to future use; and the knife should be directed in the course of the milk ducts —*i. e.*, from the centre in a direction toward the circumference. Rarely will a counter-opening be necessary.

In submammary abscesses the incision should be made along the

lower border of the gland, which need not be included in the wound, and a large drainage-tube should be inserted.

Where more than one abscess cavity exists in the gland tissue, an incision, under antiseptic precautions, should be made large enough to admit the forefinger, which may be then used to break down the intervening dissepiments of inflamed glandular substance, or independent openings may be made, drainage-tubes introduced, and antiseptic dressings and pads of carbolic or iodoform gauze applied. Upon the first change of the dressings, which need not occur under ordinary circumstances for three or four days, often remarkable progress in the healing process may be noticed.

The application of moist warmth by poultices and fomentations should cease upon the arrival at a decision to incise, and the strictest antiseptic precautions should be rigorously insisted upon afterward. In many cases the child need not be weaned, though the constitutional disturbance will sometimes solve the problem by checking the milk supply in both breasts, but very often the persistent use of a good breast-pump will keep the sound breast secreting until the abscess is put upon the road to recovery, when suckling may be again permitted.

Although one often sees in the case of poor women that a child continues to thrive who has all along been kept even at the inflamed or suppurating breast, nevertheless, it is advisable to reject the milk pumped out of the breasts until the severity of the constitutional symptoms passes off. Sometimes weaning must be carried out where the sucking of the child at the sound nipple causes such a rush of blood and rapid secretion of milk in the inflamed breast as seriously retards or prevents resolution.

Where sinuses remain long after the active mischief has subsided, they, and the cavities to which they lead, should be slit up, scraped by a Volkmann's spoon, and touched with a strong solution of chloride of zinc, and dressed antiseptically.

When considerable hardness and induration remain, the breast may be strapped with mercurial plaster, or after rubbing in a weak mercurial ointment or a solution of the oleate of the same metal, a belladonna plaster may be worn, or the rubber bandage may be tried for a short time. Iodides internally, in full doses, may be given with advantage in such cases.

The writer has seen a case where a series of chronic abscesses continued to form for nearly a year, and though sinuses were freely slit up and scraped, and rapid healing resulted, other abscesses or sinuses appeared afterward, and only yielded to the slitting up and dissection of every tract where pus had formed. Such cases are wearisome, and can only be successfully treated by radical measures. The injection of antiseptic liquids, counter-irritation, strapping, pressure, and the administration of internal remedies are worse than useless, as they may only tend to keep up the irrritation.

Galactoceles or milk cysts, when they form, should be freely opened

with proper antiseptic precautions, a portion of the cyst wall excised, and the case treated upon general surgical principles.

MANIA.

As mentioned under Insanity, the treatment of the different forms of mental disease can only be carried out in special institutions possessing the numerous requirements which are now considered necessary for the successful management of the insane. This remark applies to ordinary acute mania, but it will be necessary to briefly refer to the management of acute delirious mania (sometimes called brain fever), a serious and often fatal disease coming on with surprising suddenness, and requiring treatment before the necessary removal to an appropriate asylum can be determined upon or carried out.

The first point in the management of such cases is to look closely to the feeding, and as the patient almost always refuses food, forced feeding thould be commenced without delay, and steadily insisted upon in spite of all obstacles every third or fourth hour during the day and night.

Strong broths, beef essences, milk and eggs, and a small quantity of stimulant in most instances should be introduced into the stomach by means of the India-rubber tube. Nutrient enemata should be also given. At a later period cod-liver oil should be given in ounce doses when the stomach retains it.

In addition to these supporting measures, sleep and quiet must be secured, and bromide of potassium and hyoscine are called for. Opium is to be avoided, unless other hypnotics fail. Chloral is the favorite drug, and with many specialists the treatment of this affection is summed up in the words "feeding and chloral." See under Insomnia, where the relative merits of all the hypnotic and narcotic drugs are fully discussed.

MASTOID CELLS, Suppuration of—See Ear, Diseases of.

MASTURBATION.

The evils arising from this filthy habit have been generally exaggerated, and as regards treatment, the physician will be much more frequently consulted by hypochondriacs who imagine that they have been injured by the practice than by those who continue to pollute themselves by it. With children the case is different. Detected by their parents or guardians, the advice of the physician is often sought as to the best method of putting an end to the habit, and if there be any causes such as adherent prepuce or phymosis, or a very long foreskin, circumcision generally affects a speedy and permanent cure.

In the case of lads about puberty, who have discovered or who have been taught the evil habit by others, circumcision may also be resorted to, as an elongated prepuce is a constant source of suggestive irritation,

and, when present, appears to greatly aggravate the vice. Moreover, the operation certainly makes a distinct break in the habit, which with close supervision and good moral treatment, may end in a complete emancipation from the thraldom which some boys have not the force of character to break through without external assistance.

In the case of girls, any unhealthy condition of the genital organs may lead to the establishment of the habit, and absolute cleanliness, with close supervision, may lead to a removal of the trouble. With older girls, who have been educated by others into the practice, only moral treatment will be of use. These cases are most unsatisfactory, as too often masturbation gets hold of those in whom the moral sense is not very acutely developed, and there may be little to appeal to.

It is often a symptom of mental deficiency or the first indication of some psychological disturbance, and has too often been regarded even by specialists as the cause instead of the result of insanity.

Where moral treatment fails, resort to mechanical methods of preventing the act may be tried by tying the hands after undressing at bed-time, and by arranging that the patient shall not sleep alone, or by causing the patient to sleep with a hard body like an empty cotton reel fastened over the spine, so that when he turns upon his back during sleep its pressure awakes him. The plan of blistering the penis or labia is a severe and almost brutal method, open to serious objection, and not even likely to be followed by any permanent benefit.

Free purgation, or measures to insure the regular emptying of the rectum and the removal of thread-worms or anal irritation from whatever cause, are not to be overlooked.

The avoidance of bad companions and indulgence in filthy conversation and impure literature must not be omitted. Free open-air exercise, pushed to the extent of inducing fatigue before bed-time, plain, unstimulating food, change of scene, amusements, and of surroundings, and attention to every measure calculated to improve the physical tone, should be advised.

Where moral treatment fails entirely, drugs are not to be depended upon, but where there is a continual struggle between an unhealty, precocious, sexual appetite and a weakened will, victory may be won for the latter occasionally by the administration of bromide of sodium or potassium, in conjunction with iodide of potassium and cold baths.

Blistering over the occiput and upper cervical spines is occasionally useful in allaying the excitability of the sexual centres.

The physician is often consulted by perfectly healthy patients who have practised the habit of masturbation for a time during boyhood, and who become almost distracted, after the perusal of some sample of pernicious quack literature, with the thought that they have ruined themselves. In such cases, the firm assurance of the physician that the habit has left no injury behind it generally restores the patient's mind to a healty state. (See under Impotence, Spermatorrhœa, etc.)

Regarding preventive treatment, it is a serious question whether

boys should be warned against the evils of a practice of which they may know nothing, and there cannot be a doubt but that in some few cases such warning may produce the opposite effect, though many authorities who have had considerable experience of the training of boys follow the practice of sounding an alarm as a matter of routine. To be free from objections, such warning must be most judiciously administered to innocent and sensitive youths.

MEASLES.

The treatment of all the exanthemata differs little except in points of detail, and the following remarks will apply also to the general management of scarlatina, typhus, typhoid, and smallpox. At the onset of the disease, the patient should be put to bed. A wire spring mattress, upon the top of which a thin, hard hair mattress is placed, and moderate amount of bed-clothes, should be provided. The temperature of the sick room should not be allowed to exceed 60°F. Certainly, in the absense of special reasons, such as laryngeal complications, the atmospheric temperature should not exceed 65°F. The most thorough ventilation should be secured, and a continuous supply of pure warm air is essential. Tait's thermic ventilator is the most valuable sick room luxury. Where the physician has the choice of rooms for the treatment of any of the exanthemata, he should select a large, airy apartment, with an open grate, and, when possible, with a ventilator opening into a flue. The bed can be surrounded by a couple of screens in a large room; this will enable the most thorough ventilation to be carried out without subjecting the patient to draughts of cold air.

In the case of measles, it is customary to have the light subdued by partially drawing the blinds, but the complete darkness so often insisted upon is unnecessary, and the patient's own feelings may be taken as a guide in this matter. The less unnecessary furniture and hangings or drapery the better.

In the management of scarlatina and smallpox this is of considerable importance, and it is well to clear everything out of the room that cannot be afterwards subjected to thorough fumigation or disinfection. The physician should give such instuctions regarding the use of disinfectants during the illness as will prevent the risk of injury to the patient by their being employed too freely.

In treating infectious diseases in the patient's home, it is a good plan to place a large vessel filled with water and Condy's fluid (about 1 : 50) outside the door of the sickroom. Into this vessel all articles leaving the room may be dipped. In the case of scarlatina and smallpox, a sheet dipped occasionally in a solution of carbolic acid (1 : 100) or chlorinated lime (1 : 200) may be suspended outside the door, in order to more effectually cut off the room from the other parts of the house. Urine and feces should be passed into vessels containing a small quan-

tity of some disinfecting or deodorising substance. Terebene, eucalyptus, carbolic acid, or other spray may be diffused through the atmosphere occasionally.

In the early stages of the fever of measles little drugs are required. The following old-fashioned mixture can do no harm, and often affords some relief by encouraging the action of the skin; it may be administered until the decline of the eruption:

℞.—Spt. æther. nitrosi ℥ij.
Liq. ammon. acetat. ℥ij.
Tinct. croci ℥j.
Syr. et aquæ ad ℥iv.—M.

S.—A teaspoonful of this may be given every two or three hours to a child from two to four years of age.

Diet must be closely attended to. Where the patient can take milk freely there is no difficulty, as milk alone or diluted with half its amount of lime-water, or aërated soda, or kali water may be given in any quantity. Where the patient has a natural dislike to milk, weak soups, beef tea, or any liquid nourishmint may be given. It is, however, a mistake to force nourishment under these circumstances. Often a child who refuses milk can be tempted to take tea, and this may consist chiefly of milk flavored with a little tea. In such a liquid, biscuit may be soaked, or toast and crumb of bread may be added.

As the fever increases diluent drinks may be freely given, and it is wrong to refuse cold water when the patient craves for it. It is difficult to see the origin of the popular prejudice against water being allowed to patients parched with fever. It should only be temporarily withheld in those instances where it is taking the place of nourishment. Weak barley water, to which lemon juice and a little sugar has been added, or homemade lemonade may be freely given. When thirst is very great, ice may be freely administered in small quantities.

Coryza may be safely let alone. It rapidly subsides upon the decline of the eruption, and is generally relieved by cutting off the supply of bright light.

Cough is often most troublesome, and in some cases almost alarming and is liable to resist drugs until the eruption begins to fade. The diffusion of steam through the air or an inhalation of conium or very weak carbolic spray to the fauces, with ipecacuanha wine internally and warm poultices externally generally afford relief. In adult patients tartar emetic (20 minims of the wine, with $\frac{1}{10}$ to $\frac{1}{20}$ grain of morphine) may be given with advantage.

Fever when running very high must be checked, and, as there is a strong objection to the cold bath as an antipyretic before the appearance of the eruption, the temperature should be watched, and when it reaches above 104° an antipyretic should be administered.

Antipyrine or antifebrin may be safely given in measles under such

circumstances, though their routine administration in all cases of the disease is unnecessary. Two grains of antipyrine or ½ grain of antifebrin may be given every three hours to a child from one to two years old. When hyperpyrexia occurs after the rash has come well out, and where the temperature reaches 106° or more, a cold bath or cold pack should be at once given, and the patient kept in it until the temperature falls to normal. Waugh thinks that the disease may be cut short by phenacetin. The bowels should recieve one moderately smart clearing out by a saline purgative, and further purgation is unnecessary, unless constipation set in. Diarrhœa, if present, should not be interfered with, unless it threatens to exhaust the patient's strength.

Itching, when the eruption is well out, may be a troublesome symptom. It is generally relieved by sponging the limbs and face with a warm or tepid solution of bicarbonate of soda.

Where convulsions occur, or where stupor with marked exhaustion is observed before the appearance of the eruption over the entire body, especially when traces of it have been observable for one or two days about the head, a *hot* bath should be given, with the view of causing a smart determination of blood to the cutaneous surface. After such a bath the body should be properly rubbed dry with warm towels, and the patient wrapped up in flannels and put to bed before the possibility of a chill occurs.

Convulsions at a later stage generally indicate the onset of some serious complication, such as pneumonia or meningitis, which is to be met by the administration of such remedies as are indicated in these affections. Pneumonia is apt to run a very protracted course, and must be met by ammonia, quinine, stimulants, and hot poulticing.

Bronchitis, catarrh of the meatus or troubles in the middle or internal ear, ophthalmia, adenitis, and other complications, are to be met by the remedies mentioned under the names of these affections.

Stimulants are seldom necessary in ordinary uncomplicated cases; but where serious complications as those just mentioned are present they must be judiciously administered. The exhaustion and serious drain made upon the system by severe attacks of measles often lead to a fatal issue, notwithstanding the popular notion that the disease is generally a trivial ailment.

Hence, after the decline of the eruption, every care must be taken to keep up the general strength by large quantities of easily-digested and easily-assimilated food. The after-treatment is sometimes of much greater importance than the management of the case prior to the decline of the fever. Tonics may be needed to improve the appetite, and iron to combat the anæmia which often results. These objects may be accomplished at the same time by giving a mixture containing quinine, with small doses of the tincture of iron. Cod-liver oil is very valuable at a later stage. Where convalescence is protracted, stimulants may be employed in the after-treatment with advantage, and when administered they should be given with the food. Thus brandy or whiskey

may be added to the milk. The writer prefers to give the stimulant in the form of wine whey, which can be readily prepared by adding one wineglassful of sherry to one pint of milk, raised almost to the boiling-point; the fine curd should be rejected. Children, as a rule, take this mixture readily. When whooping-cough is present, a not uncommon complication, the case calls for very careful management, free stimulation being sometimes essential, and further pulmonary troubles must be met by smart counter-irritation and stimulating expectorants.

Bichloride and iodide of mercury have been used internally as routine remedies, but the writer has no experience of their use. The solution of peroxide of hydrogen has given good results.

In the absence of complications, the patient may generally be permitted to leave his bed, though still to remain in his room, after the lapse of a week. It is difficult to keep those who have just passed through a mild attack of measles from exposing themselves to the variations of temperature out-doors. The children of the poorer class run about often before the eruption has entirely faded, and the result is that large numbers of them perish from secondary bronchial or pneumonic troubles. The dangers of exposure should be insisted upon to parents, and the body should be well enveloped in flannels, even in the summer time. In winter, a child should not be permitted to take open-air exercise for at least a month after the seizure. Drives should not be permitted until the patient has been allowed to move about. To all who have had much experience in the extern department of a children's hospital, it is evident how numerous are the cases of phthitis and severe visceral and bone affections, whose origin can be traced to the shattered state of health following severe attacks of measles. In the writer's experience, which is not limited in this manner, such serious sequelæ are much more common after measles than any other affection, and they point to the necessity for prolonged careful feeding and nursing, long after the period when danger is generally supposed to have passed over.

MEGRIM, MIGRAINE, OR HEMICRANIA.

The treatment resolves itself into the management of the attacks, and also into the employment of such measures as will tend to prevent their recurrence.

Of all the agents ever used to relieve the pain of megrim, none can be compared in certainty or rapidity of action to antipyrine or antifebrin. The action of these remedies still requires satisfactory explanation. Though there is no doubting there marvellous efficacy, nevertheless, it is difficult to explain their *modus operandi*. Patients, who for years have been periodically laid aside, unable for shorter or longer periods to discharge the duties or enjoy the pleasures of life, notwithstanding the use of the older narcotics, have been now placed in the position, thanks to antipyrine, that they need not suffer many minutes' pain or inconvenience. For the past three or four years since the

writer first used this remedy for the pain of megrim, he has not seen one case where it failed to give marked relief.

As soon as the patient feels the first symptoms of an approaching attack, he should be directed to take 10 grains of antipyrine, or 5 or 6 grains of antifebrin in the form of a powder, mixture, or tabloid. Should the pain continue, half these quantities may be given every hour for three or four times, but it is rare for an attack to stand out against the second or third dose. Where there is any reason to suspect that the drug may disagree or produce unpleasant symptoms, half the above doses may be given every thirty minutes. There is evidence that patients suffering from high fever can take much larger doses of antipyrine than if the temperature was normal. And, though the writer only once saw any unpleasant effects from the drug in some thousands of administrations in numerous diseases, many instances of untoward results have been published from time to time, and it may be, upon the whole, wiser to give smaller doses, say, 3 or 4 grains every twenty or thirty minutes, until relief follows. Bokenham reports the treatment of twenty-six cases; in every case the result was perfectly satisfactory, though the dose never exceeded 4 grains, and generally only two doses were necessary. An augmentation of the original dose is seldom required in after-attacks.

Exalgine will probably be found to give equally satisfactory results. The experiences of antipyrine, apparently for so far, meet every requirement, and it may be considered unnecessary to enumerate the various drugs which have been hitherto employed to relieve the attack. But, as antipyrine sometimes fails to cut short attacks which cannot be regarded as those of typical megrim, and as other agents are decidedly beneficial in such cases of what may be called "migrainous headaches," the most important of them may be here enumerated.

Little, up to October, 1885, stated that he did not know of any treatment which had any distinct power of cutting short an attack of migrainous headache when it came, or even of mitigating its severity, discovered that 20 grains of salicylate of soda generally gave speedy relief. He recommends it to be taken in a wineglassful of water, to which a dessertspoonful of the effervescent granular citrate of caffeine has been added. The dose administered in this form is not unpalatable, and it may be repeated in two hours again, if necessary; and he found that it did not lose its power in relieving subsequent attacks. The writer is not aware that this remedy has been found to relieve migrainous headache where antipyrine has failed, but its use is clearly indicated when such cases are found to occur. In some of the writer's cases the antipyrine seemed to lengthen the intervals between the attacks.

Haig has closely studied the relations existing between the paroxysms of megrim and the excretion of large amounts of uric acid, and found that by the administration of full doses of any acid he could at pleasure check the amount of uric acid in the blood and in the urine.

He gave 60 minims of diluted nitro-hydrochloric acid in a tumblerful of water, one-half of which was swallowed as soon as the pain came on, and the other half in thirty minutes later; the headache was generally removed in about an hour after the second dose. An equivalent of citric acid does equally well. The writer has not been able to corroborate this observation in a few cases in which he has tried the acid treatment.

Indian hemp is a drug which has been found of considerable value in megrim, and the reports of Anstie, Seguin, Greene, and others, show that it not only relieves, but that it has been found to decidedly cure the disease, as the bromides sometimes do in epilepsy, $\frac{1}{3}$ grain of the alcoholic extract being given night and morning for eight or twelve weeks. One statement made by Greene is at variance with the writer's experience. He states "that, unlike opium, no craving for further doses follows its medicinal use, and apparently it can be given up without the slightest effort at any time." In severe cases it can be given with advantage after antipyrine has been employed to relieve the pain. It is also a remedy of great value in *continuous headache*, especially when occurring in women.

Bromide of potassium or sodium is sometimes of use in 30 grain doses in relieving the paroxysms, but it far more frequently fails, and in the typical form of the disease it appears to have no appreciable effect in preventing the attacks, and since the virtues of antipyrine have been demonstrated, it will gradually fall into disuse, except in the irregular or aberrant types of migrainous headaches.

This drug may in some cases be advantageously combined with antipyrine. Thus—

℞.—Phenazoni		℥jss.
Potassii bromidi		℥iv.
Spt. chloroformi		℥ij.
Aquæ camphoræ	 ad	℥viij. —M.

S.—A large tablespoonful for a dose, when the attack of headache comes on, and a dessertspoonful every morning and evening between the attacks.

Caffeine and strong coffee occasionally give some relief, and may still be employed in conjunction with antipyrine and cannabis.

Guarana, or an extract prepared from the ground seeds of paullinia sorbilis, which contain the alkaloid guaranine, is more efficacious than caffeine, with which it is identical. Five grains of the alkaloid, or 25 or 30 grains of the cake, may be given every two or three hours. It was, perhaps, the best routine treatment prior to the introduction of antipyrine treatment, but it very frequently failed entirely.

Chloral hydrate, by inducing sleep, may sometimes be found to cut short the attack.

Croton-chloral or butyl-chloral hydrate is of feeble power in megrim, and in the absence of neuralgia of the fifth nerve is not worth a trial.

Nitrite of amyl or nitro-glycerin may be tried in migrainous headache, but in the typical form it only occasionally gives any relief.

Menthol, cajuput, and eucalyptus oils have been given in doses of 5 to 10 grains or minims with very variable degrees of success.

Cysticine, the active principle of the laburnum, and found also in arnica, has been reported as very efficient in the treatment of violent cases associated with dilatation of the vessels. The hypodemic injection of 0.003 gramme may be given upon the strength of Kræpelin's statement. It is a remedy of which the writer has no experience, and since the introduction of antipyrine may never be again employed.

Morphine hypodermically has been recommended, but the remark just made will apply also to it; and tonga, belladonna, picrate of ammonia, ergot, gelsemium, actæa, picrotoxin, digitalis, camphor, ammonium chloride, alcohol in one full dose, henbane, valerian, sumbul, and many other drugs vaunted as cures from time to time, may be dismissed with the same remark.

Locally, some agents may be useful at times in conjunction with the treatment already detailed. Among these may be mentioned warmth to the head, the ice bag, ether spray or methylene spray, sinapisms to the back of the neck, tight bandaging of the head, and exclusion of light, atropine to the eyes, belladonna to the forehead, and menthol or veratrine in the form of ointment over the brows.

Galvanism is of undoubted value, especially in the continuous migrainous headaches, and the writer has found it of much benefit to those who suffer from more or less constant headache between the attacks of megrim. The current from four or five Leclanché elements may be passed through the head for two or three minutes at a time, one pole resting upon the forehead, and the other below the occiput.

Purgatives are generally useless, and the darkened room is not indicated when we have drugs capable of giving speedy and complete relief.

Of the treatment between the attacks little can be said until their cause has been discovered, and in some instances a brilliant effect may be produced by correcting the fault to which they owe their origin. Thus, if the megrim has been depending upon some errors of accommodation or upon astagmatism, the paroxysms may never return after these have been corrected by suitable glasses. Severe mental work, as a rule, does not produce megrim, but mental worry is a very common cause. Vexations of one kind or another, and irregularity in the hours of sleep, and prolonged anxiety or grief, are common factors. When such can be avoided, as by change of scene and occupation marked relief follows.

Though much has been written about the effect of tonics, the virtues of strychnine, bromides, iron, cod-liver oil, purgatives, special dieting, etc., little dependence need be placed in any of them, only in as far as they bring a debilitated organism up to a healthy standard, after which constant open-air exercise at every available opportunity, regularity in

the hours of meals, time of rest, and in the periods of intellectual labor, will do much to prevent return. Constipation, insomnia, indigestion, lithæmia, etc., must be relieved, and, in the case of children, the shortening of school hours and the abolition of the pernicious cramming plans, the indirect outcome of the objectionable "result fees" system, may achieve a good deal.

Of the various specific drugs which have been found beneficial in the prevention of megrim, there is much difference of opinion about their relative values. The writer finds a long course of arsenic in small doses as the best, To this may be added a pill of the extract of Indian hemp, as already mentioned; ⅓ grain may he given at bedtime. Chloride of ammonium, iodide of potassium, phosphorus, and salicylates, with alkalies, may be tried where arsenic fails. No harm can result from a nightly dose of the bromide of sodium or potassium in conjunction with as much cascara sagrada as will keep the bowels open without purging.

Little advises sponging with hot water in the morning, followed by a cold douche over the shoulders and spine, and a sparing use of tea, with the following pill to be taken after breakfast and dinner:

℞.—Sodii arsen. gr. $\frac{1}{12}$.
Ext. cannab. ind. gr. $\frac{1}{6}$.
Ext. belladon. gr. $\frac{1}{3}$.
Zinci valerian. gr. ij—M.

Make twenty-four of such pills.

MELÆNA.

As this symptom depends upon the outpouring of blood into the stomach, small intestines, or the upper part of the large intestine, its treatment will depend upon the cause of the hemorrhage. Thus an ulcer of the stomach, congestion of the liver, or ulcers in the duodenum or intestinal tube high up, may be the origin of the blackened or tar-like evacuations, and the appropriate treatment will consist in the judicious administration of remedies calculated to check the original disease. Under Hæmatemesis will be found the remedial agents used to stop the bleeding when its seat is in the stomach.

Most of these drugs are administered when the bleeding is from a point lower down in the alimentary canal. Acetate of lead and opium, alum in large doses, and the extract of hæmatoxylon in pilular form, and turpentine in the form of capsule, are employed to reach the bleeding surface in the small intestine.

MELANCHOLIA—See Insanity and Insomnia.

MENIÈRE'S DISEASE—See page 222, and see under Tinnitus.

MENINGITIS, Cerebral (Simple).

The treatment of the original condition is of importance when the meningeal inflammation is found to be secondary to erysipelas, or disease of the petrous portion of the temporal bone, or when it occurs in the exanthemata, in pneumonia, syphilis, ulcerative endocarditis, and injuries to the cranial bones.

The patient should be put to bed and kept upon his back, with his head elevated. The utmost mental quiet and absence of noise, bright light, and jarring vibrations of every sort, must be ensured.

Diet should consist of small quantities of iced milk; and in the earlier stages animal food, even in the form of beef tea or meat extracts, should not be administered, and the same remark applies to alcoholic stimulants. One smart purge should be given to ensure the thorough evacuation of the intestinal contents. A moderate dose of calomel, followed in five or six hours by a saline cathartic, is a good routine method of accomplishing this object.

Where pain is a very prominent symptom, two or three leeches may be applied to each temple or behind the ears.

Cold to the scalp is the most valuable local treatment, and in order to ensure its application to the best advantage the hair should be cut close by sharp scissors, or, better still, the head should be thoroughly shaved. A light rubber ice-cap or bag, or a bladder moderately filled by small pieces of ice, should be applied evenly to the forehead and scalp. Where this is not at hand, a good substitute may be quickly extemporized by tying up a quantity of broken ice in a sheet of thin gutta-percha tissue and applying it in the same way. Cold lotions, or compresses of lint or linen containing small pieces of ice in their folds, may also be used. Leiter's tubes are sometimes preferred. A handkerchief wrung out of iced water, and frequently renewed, answers well in the case of restless children. The persistent use of cold applications to the head always affords some relief, and may induce sleep after other methods fail.

Counter-irritation to the nape of the neck and occiput is a valuable agent in relieving pain and restleness, but this should seldom take the form of blistering, especially as the patient lies upon his back, and a large blistered surface in contact with his pillow and supporting the weight and pressure of his head and neck is liable to be followed by very unpleasant results. Mustard poultices fulfill every requirement, and they can be repeatedly applied if thought necessary during the illness.

Blisters to the scalp are used by some physicians. Their utility is very doubtful. They should not be tried except where for some cause the ice-bag or cold applications cannot be used, and, moreover, they produce great discomfort in the early stages of the affection.

Where these measures fail to relieve headache and induce sleep, the

important question of administering opium crops up. About this there have been very varying opinions held, but it may be said that those who have most experience express the least hesitation in giving it. Since the discovery of Lepine of the analgesic properties possessed by the new hypnotics, there is not the same difficulty about relieving headache; and the writer has employed antipyrine with much satisfaction in small and frequently repeated doses in meningitis. He has not had an opportunity of giving exalgine in such cases, but it may be found better than either antipyrine or antifebrin. Sulphonal or chloral may be given to induce sleep when the pain is relieved by other measures.

Bromide of potassium is sometimes of use in allaying cerebral excitement, blunting pain, and inducing sleep, but as a rule only disappointment is to be expected from it in severe cases. It may, however, be freely given when convulsive seizures are a prominent feature in the case. It can be also given to great advantage under these circumstances in combination with antipyrine. (See the formula upon page 494.)

Iodide of potassium in large doses may be tried with some hope of success where vomiting and gastric derangement are absent, and in the later stages of syphilitic meningitis it may be very valuable.

Vomiting may be best relieved by giving small pieces of ice to be swallowed whole, and by administering a plain effervescing mixture containing a few minims of liquor morphinæ (1 : 100) with hydrocyanic acid and bismuth.

Aconite alone, or combined with bromides, is of value where there is much fever and rapidity of pulse, with a dry skin.

Cold douches and cold affusion have been successful, especially in cases following exposure to the sun or strong heat.

Where the headache, delirium, fever, and insomnia appear to be uninfluenced or aggravated by these measures, and the disease appears to be rapidly passing into the stage of exudation, the advisability of blood-letting should be considered. Cases are upon record where this remedy appears to have been the means of cutting short the attack and saving life; and since the duration of the disease is often so short, the extraction of blood is not likely to be followed by an asthenic condition dangerous to the patient's ultimate recovery, as is the case in affections running a chronic course.

The writer's experience of blood-letting for meningeal inflammation is unfortunately confined to one fatal case, but he would not hesitate to employ it again in a suitable case after the ordinary remedial agents had failed.

When exudation has already taken place, as evidenced by stupor and approaching coma, with alteration of pulse and pupils, some recommend blood-letting even at this stage, but there are good reasons for believing that when coma has set in the indications for venesection have passed away. When the patient is still able to swallow, iodides

may be pushed in large doses if not already administered, but should they have been given from the first, there is little hope to be gained from a further trial.

Purging may now have a chance, and a saline cathartic may be given, so as to produce frequent watery evacuations every two or three hours, and there have been rare examples of the benefits of this measure even when stupor bordering upon coma had supervened. Croton oil may be given when swallowing is impossible or difficult. Any benefits to be obtained from this treatment may be expected to show themselves very soon, and it is obvious that it cannot be long continued.

Supposing the case to have gone on from bad to worse, and coma to be now established, is the physician to surrender his arms and retire from the contest? or is he to content himself with ice to the head or blistering of the scalp? Doubtless by leaving all cases to nature the physician may once or twice in a life-time see a recovery.

When one studies the reports of the active treatment of the last generation of practitioners, two conclusions may be safely arrived at: 1. That some lives have probably been sacrificed to injudicious and indiscriminate leeching, blistering, purging, and blood-letting, especially when commenced at an early stage before a correct diagnosis was possible; 2. that at a later stage, in apparently desperate or hopeless cases, a larger proportion of recoveries may be noted after such treatment than occurs where simple expectant measures are employed.

The writer has witnessed such unmistakeable benefits follow the free use of mercury, that he is driven to the conclusion that to withhold this remedy in desperate or apparently hopeless cases of simple meningitis is unjustifiable. He is aware that this is strong language, and that by taking such a position he lays himself open to the censure of those who refuse to believe in the efficacy of drugs where the *modus operandi* of their action is not open to demonstration.

Nothing is easier than to cry "*post hoc non propter hoc*" when recovery follows salivation, but he who witnesses the *rapid* recovery of consciousness after the inunction of mercury, in a patient who has remained in a state of coma, with insensible pupils, local paralysis, squint, etc., will be slow to attribute the recovery to nature, since without the employment of the drug he never has witnessed the same astonishing phenomenon when the case has been treated with other drugs.

Given, then, a case of simple meningeal inflammation, in such a stage as that just referred to, there should be no hesitation in rubbing in the ungt. hydrargyri for thirty minutes into the skin on the front of the abdomen, groins, and arm-pits. Where no evidences of improvement or of salivation are forthcoming, the inunction may be repeated in twelve hours again.

It is no objection of a serious nature to urge against this plan of treatment that there is a possibility or probability of the presence

of tubercle. Such an event may not be capable of demonstration, and if tubercle exists, the case is one which, in the present state of our knowledge, we are in the habit of regarding as one which is certain to end in a fatal issue.

The writer has satisfied himself that he has seen at least one patient who was snatched from death by this treatment, after coma and paralysis had lasted nearly a week, and he has repeatedly witnessed surprising amelioration of the symptoms and return of consciousness even in cases undoubtedly of tubercular nature. In the case just referred to there could not have been any syphilis, and the patient is still living and perfectly healthy since the attack—fifteen years ago. In meningitis from fracture of the bones at the base of the skull, Hutchinson strongly insists upon the benefits of early salivation, which he says is harmless. (See also page 333.)

When the acute symptoms have passed away, the greatest care will be required in dieting, a return to animal food or stimulants being likely to be followed by a return of the headache. For a long time absolute rest and freedom from all excitement must be insisted upon, and tonics or iron should not be resorted to until the patient is able to move about. Bromides and iodides combined afford the best treatment at this unfortunately rare stage of the malady. Rectal feeding may be necessary during the prolonged coma, when swallowing is impossible.

Chronic cerebral meningitis, being secondary to other affections, its treatment will consist in the remedies applicable to the primary lesion.

MENINGITIS, Cerebro-Spinal.

The epidemic forms of this affection, also known as cerebro-spinal fever, are so variable in their symptoms and degrees of severity, that there is much difficulty in giving any outlines of treatment which will be applicable to the majority of cases coming under the notice of the physician, especially since it has been observed that agents of use in one outbreak have been found to be productive of mischief in others. No drug can be said to exert any specific action upon the disease; but various remedial agents have been found to control or modify the symptoms and to tide the patient over the critical stages of the affection, so as to give Nature a chance of asserting her influence.

The patient should be placed in bed is a quiet, darkened, well-ventilated room, with his head and shoulders slightly raised by pillows, and the general treatment applicable to cases of cerebral meningitis may be adopted.

In sthenic examples of the disease blood-letting may be necessary, either in the form of venesection, wet cupping to the spine and occipital region, or leeching of the same localities, and smart purging is sometimes useful. In asthenic cases, or when collapse ushers in the disease, the opposite line of action must be promptly taken by administering alcoholic stimulants and concentrated nourishment in free and some-

times even in unlimited amounts, with warmth and sinapisms to the surface.

Pain calls for analgesic remedies, and most authorities use opium or morphine liberally. Possibly antipyrine, antifebrin, or exalgine may be found preferable, especially when the temperature is high at the same time. Some authorities regard opium as the only remedy to be relied upon all through the attack, and Stillé gives 1 grain every hour or two hours.

Cold compresses, evaporating lotions, or the ice-bag, not only relieve pain in most cases, but they appear to have some beneficial action, as in cerebral or spinal meningitis. Occasionally cases have been met with where warm applications have given relief.

High temperature may be relieved by the cold pack or by antipyretics. As just stated, the new febrifuges may be tried, though the writer is not aware of any reports of their use. Warm or even hot baths or packs may be indicated when the asthenic types of the disease are met with.

Quinine has enjoyed some reputation in cerebro-spinal fever, but its usefulness is denied by many. It would probably act best in malarial forms, or where the fever was running very high, or in asthenic cases. To be of use large doses should be given at short intervals.

Bromides, combined with belladonna, morphine, ergot, antimony, chloral, digitalis, gelsemium, and aconite, have been recommended, but any benefit obtained is probably owing to the action of bromides in this stage.

When effusion has taken place the same measures whose utility has been discussed under the head of Cerebral Meningitis may be tried.

These are (1) blistering, (2) purging, (3) iodide of potassium, (4) mercury. Iodide of potassium is the least objectionable of these methods. As the disease is so frequently characterized at this stage with asthenic symptoms, it must be given in full doses to be of any use, and 10 grains may be given every five or six hours. Where it fails in showing any signs of causing absorption of effused products, and where these are manifestly incompatible with life, owing to the pressure which they are exerting, there is nothing left but to bring the patient rapidly under the influence of mercury by rubbing in the ointment of the Pharmacopœia.

Blisters may be tried at a later stage if mercury succeeds in warding off the urgent symptoms, and they may be very useful in very chronic or prolonged cases alone, or in conjunction with the continuous current, massage, hydropathy, etc.

MENINGITIS, Spinal.

The treatment of this affection is to be carried out upon the same principles as are applicable to the management of cerebral meningitis, and need not be dwelt upon in detail. They are the same for spinal

pachymeningitis, arachnitis, and the varieties of spinal leptomeningitis, and they may be summed up under the following heads:

1. Absolute rest in the horizontal position on the left side or face.
2. A diet chiefly of milk and farinaceous foods, with little or no stimulants.
3. Local bleeding by leeches and wet cupping on each side of the spine.
4. The free use of cold, as with the spinal ice-bag or cold compresses.
5. Where these cannot be borne, warm poultices or spongio-piline wrung out of warm or moderately hot water.
6. At a later stage, the application of narrow blisters applied along each side of the spinal column.
7. Free purgation by saline cathartics.
8. The internal administration of large doses of the iodides in combination with remedies calculated to relieve pain, as hyoscyamus, morphine, antipyrine, Indian hemp, bromides with chloral.
9. Mercury may be tried in small doses. The results of salivation by inunction are not so satisfactory as in cerebral cases. Ergot and belladonna have been tried, upon the theory that they influence the circulation in the smaller bloodvessels in the cord and meninges, but they seldom do any good.
10. At a later stage hot baths, alternately with warm packs and hot douches, are of unquestionable value. The hot brine baths of Droitwich may be of use in the late stages of very chronic cases.
11. A weak galvanic constant current passed from the occiput to the sacrum is highly recommended by Erb.
12. Suspension at a later stage, when all inflammatory action has subsided, and when iodides and small doses of mercury have failed to cause absorption of inflammatory products. (See under Locomotor Ataxia.) Massage may also be employed.

MENINGITIS, Tubercular.

The chief measures from which any results are to be expected in this almost hopeless malady are detailed under Cerebral Meningitis. Where the diagnosis is beyond a doubt (which it seldom, if ever, is) the more active agents, especially blood-letting, blistering, and severe purging, are clearly contra-indicated. These measures may be here briefly enumerated: Absolute rest in a darkened, quiet, well-ventilated room, with the head elevated, a diet of iced-milk frequently administered in small quantities, and one smart calomel purge at the beginning of the disease. Cold to the head by means of ice or evaporating lotions after the hair has been shaven off the scalp, counter-irritation by sinapisms applied to the nape of the neck. Bromides or antipyrine to relieve headache which has resisted the above agents, opium being of very doubtful utility. Chloral or sulphonal may be given to induce sleep.

Iodide of potassium is the routine remedy to be administered in ordinary typical cases of the disease. It may be given with advantage in combination with the bromide, but full and frequently repeated doses are necessary if given at all. A child two years old may get 1 grain of the iodide and 2 of the bromide every two hours while the stomach is able to retain it.

Forced nourishment by milk should be carefully attended to throughout, and where milk is refused beef tea or chicken soup may be substituted, though animal food in any form is to be objected to as long as mild, farinaceous foods or eggs are swallowed and digested.

Where in spite of these measures the case goes on from bad to worse, and as stupor deepens into coma, and the pupils become dilated and sluggish or fixed, the stage mentioned under simple Cerebral Meningitis is arrived at and the same problem is to be considered, and the physician is to decide whether further interference is justifiable The considerations mentioned in detail upon page 500 apply for the most part here also. There is generally a doubt about the diagnosis being tubercular, and in this doubt lies the slender thread of hope of a successful issue. Where meningitis supervenes upon tubercular lung disease, or under such circumstances as leaves the diagnosis positive, the case may be left to its inevitable termination, but as long as any doubt remains, and as long as there is any reason to hope that the disease may be simple meningitis, the physician should rapidly bring the patient under the influence of mercury by inunction. Against this procedure little can be said beyond that it will be useless in the opinion of those who do not believe in the efficacy of mercury to cause the absorption of effused inflammatory products, it cannot increase the patient's discomfort, since he is already beyond the reach of feeling, and it is not likely to hasten the fatal issue. Mention need hardly be made of the possibility of its exerting an influence in destroying the chance of a natural cure, since this is supposed to be abandoned in the imaginary case under consideration. It may be worth while to state that the remarkable recovery before referred to under Simple Meningitis was in a patient, the daughter of a hospital nurse. Her case was regarded as hopeless, as she was believed to be dying from tubercular meningitis by those who had seen her, and after profound coma and squint had lasted several days, the writer, with the full consent of the patient's mother, rubbed in a quantity of mercurial ointment more as a pharmacological experiment than with the hope of producing any marked amelioration of the symptoms. As a free and copious secretion of saliva poured out of the mouth some hours afterward, the patient opened her eyes after a short time and rapidly gained consciousness and made a speedy recovery. The case was almost certainly not of a tubercular nature, or such results could hardly have occurred. Since then the writer has frequently satisfied himself that even in the undoubtedly tubercular form of the disease, mercury has the power

of rapidly causing the coma or stupor to clear off for a time before death.

Recently the operation of tapping the subarachnoid space in the spinal cord is being advocated, with the view of draining the ventricles.

MENORRHAGIA.

Profuse menstruation or excessive hemorrhage from the uterus at the menstrual periods may be bracketed with

METRORRHAGIA, or hemorrhage occurring between the menstrual periods, and not necessarily arising from disordered menstruation.

These conditions being merely the result of constitutional or local causes, no treatment can be of any permanent use which does not strike at the *cause* of the increased flow. Hence the proper treatment of menorrhagia will embrace remedies directed to such different disorders as the following: Bright's disease, pulmonary, cardiac, and liver affections interfering with the circulation, mental disturbances, blood diseases as purpura and malaria, uterine ulcerations, cancer, tumors, and displacements, subinvolution, ovarian congestion, climacteric disturbance, etc. After or while appropriate treatment is being directed to these causes of profuse menstrual discharge or metrorrhagia, certain routine methods of treatment may be pursued.

Rest in the horizontal position upon a hard bed or couch, with light clothing and cold milk diet, with dry biscuit, is, perhaps, the most potent of all the host of remedial agents ordinarily employed to check profuse hemorrhage from the uterus. In many cases depending upon widely different causes, absolute rest in the horizontal position tides the patient over what would otherwise be a weary and exhausting period, which drugs could scarcely modify to any appreciable extent if the patient had kept moving about.

Ergot or ergotine alone, or combined with large doses of quinine, stands far ahead of all drugs in the routine treatment. It may be given in teaspoonful doses of the fluid extract, or in the pilular form, each pill containing 1 or 2 grains of ergotine, every six hours, or oftener in severe cases, or a solution of ergotine may be injected into the buttock or uterine walls, or 2 or 3 grains may be administered as a suppository or medicated pessary.

The following combination is useful:

℞.—Ext. ergotæ gr. jss.
Ext. cannab. ind. gr. ⅓.
Quininæ sulphatis gr. iij.—M.

Make 24 of these pills.

S.—Take one every four hours.

Morphine or cannabis indica, given in doses sufficient to soothe pain and tranquillize the circulation without inducing narcotism, is always of use.

Iron in anæmic and saline cathartics in plethoric cases are of undoubted value.

Bromides in *full* doses are clearly indicated in ovarian irritation.

Hydrastis canadensis, in doses of 15 minims of the fluid extract, often succeeds even in cases where ergot has been unsatisfactory.

Digitalis, actæa racemosa, hamamelis, chlorate of potassium, oxide of silver, guaiacum, rue, senega, savin, strychnine, salix nigra, creasote, iodine, iodoform, belladonna, and a host of drugs have been regarded as specifics, but, with the exception of digitalis, their action may be said to be generally disappointing.

The following mixture may be tried:

℞.—Morphinæ hydrochlor.		gr. ij.
Tinct. digitalis		℥ ij.
Ext. hamamelidis fld.		℥ ss.
Tinct. hydrastis		℥ vj.
Glycerini purif.	 ad	℥ iij.—M.

S.—A teaspoonful to be taken every three hours in water.

Astringents (when administered internally by the mouth) like alum, tannic, gallic, or pyrogallic acids, acetate of lead, sulphuric acid, and matico, are so uncertain or inoperative as hardly to be worth trial.

Speaking generally, the treatment of increased or irregular flow of blood from the unimpregnated uterus by the administration of drugs in the ordinary way by the mouth is most untrustworthy when not backed up by measures calculated to remove the cause of the affection.

Local means of checking the hemorrhage may be resorted to when the drain upon the system begins to tell upon the patient's strength, and when this becomes very evident, local methods must be adopted.

Electricity, used according to the method of Apostoli, has been found in many cases to check hemorrhages which have resisted all treatment. The most suitable cases for this remedy will be found in those where the hemorrhage is caused by uterine fibroids or by subinvolution.

The *positive* pole should always be introduced into the uterus when a hæmostatic effect is required, and the negative applied externally by means of the clay pad. A current of 100 milliampères is generally sufficient, and the *séance* should not exceed ten minutes, and in frequency should not be oftener than twice a week.

The hemorrhage may be often checked, and even permanently relieved, by this treatment, though there be no diminution produced by the electrolysis in the size of the uterus. Where polypi can be easily and safely removed by surgical means, it is hardly necessary to say that the operation should not be delayed where serious hemorrhages continue to tell upon the patient's strength.

When the hemorrhage is the result of the presence of a multinodular myoma, the removal of the appendages arrests the growth and lessens

or stops the hemorrhage, but if depending upon the soft, œdematous form of myoma, this operation is useless.

Intra-uterine injections of strong solution of chloride of iron, nitrate of silver, pure carbolic acid, creasote, or iodine are sometimes employed. Their use is, however, fraught with considerable danger, and should be left in the hands of the specialist. When their employment is considered absolutely necessary, the cervical canal must be dilated to the extent of permitting their flowing backward.

It is generally advisable to employ a contrivance upon the principle of the double-barrelled catheter, which, upon being inserted into the uterine cavity, will permit the fluid to flow out through one channel after flowing in by the other, and only a very small quantity of the liquid (under a low pressure) should be injected.

When intra-uterine medication is indicated, as a rule it will be found much better practice to fully dilate the os and cervical canal with sea-tangle tents or other suitable method of dilatation, after which the medicinal agent can be freely applied to the interior of the uterus. In this way the writer has successfully treated menorrhagia caused by subinvolution of the uterus, complicated with a granular condition of the lining membrane, by freely swabbing the interior of the cavity with fuming nitric acid, as recommended by Atthill.

Where sudden and alarming hemorrhages come on, threatening the patient's life unless prompt action be taken to stop them without the loss of time entailed by waiting for the action of the above-named plans of treatment, plugging of the vagina may be urgently demanded. This performance has been fully detailed under Abortion, upon page 11.

It is advisable to always keep before the physicisn's mind the dangers and inconveniences which may be expected to follow the sudden checking of periodical hemorrhages from the uterus about the climacteric period. In such cases heroic treatment is very seldom called for. As soon as any warning is perceived of a hemorrhage already due or reasonably expected, a strong saline purge may be given, and in plethoric subjects, when time permits, this may be preceded by 5 grains of blue pill or 4 grains of calomel.

After the action of the cathartic and absolute rest in bed, the following pill may be given every four hours:

℞.—Morphinæ hydrochlor. gr. $\frac{1}{12}$.
Ext. ergotæ gr. $\frac{1}{3}$.
Ext. belladonnæ gr. $\frac{1}{6}$.—M.

Make 24 such pills.

When the attack has passed off, a pill may be given every night until the next period, and full doses of bromide of potassium should be given twice a day during the interval between the hemorrhages.

MENSTRUATION, Disorders of—See under Amenorrhœa, Dysmenorrhœa, and Menorrhagia.

MESENTERIC GLAND DISEASE.

The treatment of this affection will in no way differ from that of enlarged scrofulous glands in any other region of the body. Under scrofula, lymphadenitis, tuberculosis, etc., will be found mentioned, among other remedial agents, the following: Change of air and scene, by removal to a sheltered seaside resort, protected chiefly from the north and east, in which the patient can spend the greater portion of his time in the open air, nutritious foods in abundance, especially milk, eggs, butter, beef essences, etc., and in some cases, peptonized foods.

Of all drugs cod-liver oil stands easily at the head of the list. Next to it comes malt extract, or the combination of Kepler's extract and cod-liver oil, which is one of the most valuable additions ever made to pharmacy. Pancreatic emulsion has not maintained the high position which its first trials raised, though it is an agent of considerable value.

Iodides, especially the syrup of iodide of iron with iodide of potassium, come next in value. Iron phosphates, hypophosphites, arsenic, chloride of calcium, etc., are mentioned under Scrofula.

The writer has obtained results in advanced cases of this affection which were most surprising, after all the above had failed, and the patients were steadily passing from one stage of emaciation to a worse. Indeed, a case of chronic enlargement and matting together of the abdominal glands should be far advanced before the physician pronounces the patient to be beyond the region of hope. It is in keeping with our present views to regard all recoveries under these circumstances as if they had been instances of simple scrofulous enlargement of the glands, and not examples of genuine tubercular lesions. The writer, however, had satisfied himself that from clinical experience there are good grounds for believing that tuberculosis, limited to the abdominal cavity, is a curable affection. He had arrived at this conclusion from a clinical study of several cases before he became aware of Sir Spencer Wells's remarkable experience, where, after he had opened the abdominal cavity and finding it studded with tubercles, he closed it up and sutured the wound, the patient recovered, and was healthy and well several years afterward. The remarkable and numerous reports of cures following simple abdominal section in tubercular peritonitis are among the most striking evidences of therapeutic progress.

The treatment from which he has obtained the highly satisfactory results referred to, consists in the steady and persevering inunction of cod-liver oil into the skin over the abdomen, the oil being also given by the mouth, alone, or with malt extract.

The inunction should be carried out in the following manner: After a warm bath, the skin being thoroughly dried by friction with warm towels, a tablespoonful or more of cod-liver oil is rubbed in by the

palm of the hand before the fire into the front and sides of the abdomen, especially into the skin in the inguinal regions. A flannel roller is bound over the abdomen, reaching from the pubes to the lower part of the sternum. Over this, and covering it in at all points, is applied a broad piece of moderately strong mackintosh sheeting. The friction should be continued night and morning for the first four or five days, the same soiled flannel being reapplied each time. Soon this becomes saturated with the oil under the impervious sheeting, and as the little patient twists or moves about during the day and night, the oil is rubbed in incessantly. After the saturation of the flannel only one fresh and free application need be made in the day. The patient's clothes or linen are not much soiled, but the odor becomes very objectionable to the patient's friends, though he soon appears to become insensible to the discomfort himself. The binder need not be changed oftener than once in ten days.

Though this treatment will be found of the greatest value in abdominal glandular disease, the writer has used it in various other wasting diseases in children, with the most satisfactory results, since about 1873. He has repeatedly witnessed an ascites, warranting a tapping operation, to disappear under its use when arising from glandular mischief. He was encouraged to persevere with it in every case of this nature after observing its effects in one instance in an emaciated, scrofulous child, whose abdomen seemed distended with fluid almost to bursting, the umbilicus being protruded like the finger of a glove. The parents, believing the case to be hopeless, refused to permit tapping. The inunction was, however, persevered with, and after many weeks the patient recovered. A large mass of enlarged glands, around which the great epiploon was probably matted and adherent, slowly and steadily disappeared. The patient is now a strong, healthy young man.

It is also somewhat astonishing to see how diarrhœa disappears under the steady application of the binder and cod-liver oil in such cases, and when constipation exists, it likewise is relieved by the friction and pressure.

METRITIS.

Metritis and endometritis are most frequently found occurring together. The chief indications for treatment are almost identical in each case, and, as these have been already detailed under endometritis, they need not be detailed here, but for convenience they may be briefly formulated. Thus, for the *acute* form of metritis:

1. Absolute rest in bed.
2. The evacuation of the rectal contents by one large tepid enema.
3. The relief of pain by opium, given by the mouth, subcutaneously, by the bowel as a suppository, or by the vagina as a medicated pessary.
4. Hot fomentations, warm water compresses, or hot poultices to the

abdomen, in conjunction with local sedatives, as belladonna extract, laudanum, etc.

5. Vaginal injections of large quantities of hot water alone, or containing a small percentage of pure carbolic acid (1 ounce to 1 gallon.)

6. Warm or hot sitz-baths.

7. Leeches to the margins of the anus or over the pubes in severe cases,

8. Antipyretics or diaphoretics to encourage the action of the skin, and to reduce the temperature, when this ranges above 102° or 102.5°.

In acute septic forms of metritis, in addition to the above treatment, the interior of the uterus should be washed out with warm sublimate solution, or carbolic lotion (1 : 30), or permanganate solution (½ grain to 1 ounce), to remove *débris* of clots, placenta, etc. In some cases it may be necessary to cause dilatation of the os and canal, in order that thorough exploration of the cavity may be carried out and the removal of septic matters effected. The cervical canal should be always sufficiently patent to allow the free return of injected liquids, else an instrument upon the double-barrelled catheter principle should be employed, and the injections may be continued morning and evening until fetor diminishes, after which one syringing daily may be practised.

Where a high temperature is present, combined with the symptoms such as are met with in puerperal fever, free stimulation and the administration of 10 to 15 grain doses of antipyrine every four or six hours, until the fever heat falls, or 10 grain doses of quinine, may be administered. Failing these, in the presence of hyperpyrexia, the cold bath or wet pack may be resorted to.

The treatment of *chronic* metritis will depend upon the removal of the cause, and as in the majority of instances this will be found to be owing to a condition of sub-involution, the factors which prevent or retard the uterus from passing into its normal dimensions must be carefully sought for. These are—clots, membranes or portions of placenta being retained, lacerations, and granular degenerations of the lining membrane of the cervical canal, insufficient rest after delivery, menstruation or miscarriage, displacements or flexions of the uterus, adhesions and the tractions produced by the cicatrization of old inflammatory pelvic troubles, non-lactation, etc. Each of these being sought for and remedied or relieved as far as possible, the general indications as detailed under chronic endometritis (page 242), both constitutional and local, may be applied.

In comparatively recent cases following delivery or abortion, the free use of iron combined with ergot is of the greatest value.

Rest is often abused. In the early stages of chronic or in the late stages of acute metritis it is essential, but the prolonged rest inflicted upon patients suffering from essentially chronic forms of the disease, in the long run is productive of mischief by weakening the general

tone of the system and encouraging the passive congestion of the organs in the pelvis which is at the root of the evil.

The introduction of a comfortably-fitting ring or Hodge pessary, which will support and steady the uterus and permit the patient to indulge without pain in moderate open-air exercise between the menstrual period, is of much value. Rest, while menstruating, as a rule, is advisable.

Hot vaginal injections followed by cold alum solution, sea bathing when the patient's symptoms do not contra-indicate it, and the free use of saline cathartics, may be tried.

In very chronic cases much good may be obtained from full doses of the iodide of potassium, alone or combined with the bromide.

Locally, congestion may be relieved by periodically inserting plugs of cotton wool saturated with glycerin into the vagina, and allowing them to remain for twenty-four or forty-eight hours. Involution may be hastened by frequent applications of iodine, carbolic acid, or other antiseptic counter-irritants applied to the os, cervical canal, or interior of the uterus upon Playfair's probes. Blistering fluid and scarifications have been found useful for the same purpose when applied to the cervical canal. Emmet's operation, and amputation of the posterior lip of the os or of the cervix, is often found to stimulate the uterus to healthier action, and thus to lead to a diminution in its size. (See also Endometritis, page 243.)

MIGRAINE—See Megrim.

MISCARRIAGE—See Abortion.

MOLE PREGNANCY.

As soon as the diagnosis has been made clear by the escape of some of the characteristic vesicles or fluid contents of the uterus and there is any evidence of hemorrhage, the physician should proceed to remove the uterine contents without delay by dilating the os by means of Barnes's bags. At the same time ergot should be given in full doses.

Where hemorrhage is copious, plugging may be performed until the canal or os is sufficiently dilated to admit the dilator or finger; in some cases a laminaria tent may be necessary. After the dilatation has been accomplished, in the absence of uterine pains following the internal administration of ergot, ergotine should be given hypodermically, and the uterus emptied by expression from above, after which the case may be treated as one of premature birth or abortion.

Though it is highly desirable that all the diseased products be removed from the uterus, nevertheless it is not advisable to insure this by internal manual, or instrumental means, if possible, as there is danger of serious structural alterations having taken place in the uterine walls in some cases. For similar reasons the prolonged administration of a mixture containing ergot, quinine, and strychnine may

be indicated, with the view of producing steady contraction and hastening involution.

R.—Ext. ergotæ fld. ℥vj.
Quininæ sulph. gr. xxx.
Tinct. nucis vomicæ ℥iv.
Tinct. digitalis ℥j.
Tinct. aurantii amar. ad ℥vj.—M.

S.—A dessertspoonful to be taken four times a day in water, before meals.

MOLES.

Moles, or hypertrophic growths of the skin, generally of congenital origin, may be removed, when the cause of deformity, by the application of caustics, and when of large dimensions by the knife, cautery, or Volkmann's spoon. Caustic potash, made liquid by the addition of a little water or chloride of zinc, may be painted over the mole and allowed to scab over. The ethylate of sodium and nitric acid are also used. Any caustic, indeed, may be employed which the experience of the surgeon gives him confidence in manipulating and managing, Very large marks should be operated upon in small sections at a time, the region submitted to destruction being allowed to heal before a new portion is attacked.

MOLLITIES OSSIUM.

In writing about the treatment of a disease like the present, it is the stereotyped thing to say that every departure from health in digestion, appetite, sleep, rest, etc., is to be corrected, and the general tone of the system improved by rest, good food, fresh air, and tonics, etc. No more in this respect can be said for the general treatment of mollities ossium than of other grave conditions, and about its special treatment nothing can be said, for practically nothing is known. Absolute rest is essential, and since the disease is nearly always associated with pregnancy, the question of inducing very early labor will often thrust itself upon the physician, though the fact must not be lost sight of that where the disease is still in progress the pelvis is almost certain to be dilatable.

Unfortunately, however, if the gestation be permitted to go to full time the pelvic outlet may be found dilatable, while the brim is unyielding, in which case Cæsarean section may be demanded.

MOLLUSCUM CONTAGIOSUM.

The only treatment of any use in the majority of instances consists in the removal of the small cystic growths. Hutchinson finds that, if seen in the very early stages, frictions with equal parts of the ointments of white precipitate and sublimed sulphur will effect their removal. When upon the face, a small incision with a fine tenotomy knife and

the thorough evacuation of their contents are all that is necessary. Upon the body, they may be snipped out by scissors or the knife, or when very small and numerous they may be destroyed by ethylate of sodium solution, pure carbolic acid, nitric acid, or other caustic. When very large, a free incision into the cyst may be made, the contents squeezed out, and the cavity curetted.

MOLLUSCUM FIBROSUM.

Excision by the knife and forceps, by the elastic ligature, by scissors, or by the galvano-cautery, is the best practice. Where the tumor is large the écraseur may be necessary. The method of electrolysis by using the needle, as in the destruction of small nævoid growths, has been found to succeed without causing any mark after the shrivelling up of the tumor.

MORPHINE HABIT—See Opium Habit.

MOVABLE KIDNEY.

No treatment is called for in most instances where a movable kidney exists; but when severe pain and inconvenience follow the displacement of the organ the patient should lie down and rest in the horizontal position, with the head low and the pelvis slightly raised. In one case the writer found a patient writhing in an agony and screaming for relief, urine being voided in drops, owing to most severe tenesmus, which came on very suddenly, after some exertion. The presence of a floating kidney being suspected from a previous examination, without waiting for chloroform, morphine hypodermically, hot stupes, or the usual methods of allaying formidable spasm, he immediately caught the patient by the heels and thoroughly inverted the body. Instant relief followed.

Recurrence of such attacks may be prevented to a great extent by applying a firm bandage over the abdomen after the organ has been restored to its normal position, and if the parieties are very much relaxed, as in those who have borne a large number of children, a hard or smooth inelastic pad may be placed over the movable kidney, and a skilfully made abdominal belt constantly worn.

Niehans has devised a truss which, in some instances, may be found very useful.

Stitching of the movable organ to the abdominal walls has been successfully accomplished, and even extirpation has been performed.

MUCOUS PATCHES OR TUBERCLES.—See Condylomata.

MUMPS.

The treatment of this affection is very simple, and were it not for the fact that orchitis or meningitis and, according to some authorities,

ovarian and mammary inflammation has been found to supervene, nothing whatever might be done. The chief indication is to keep the patient protected from draughts, and the swollen region covered by warm, dry dressings. A pad of absorbent cotton wool, covered by a layer of oiled silk, is all that is necessary in most cases. Where the tension gives rise to great pain and inability to open the jaws, a hot fomentation or warm poultice may be applied, but cold lotions had better not be employed. Extract of belladonna may be smeared over the face of the poultice. Should the pain continue, with throbbing and local increase of temperature, suppuration may be feared, though the event is rare, and in this case continual poulticing with warm or hot fomentations should be persisted in until the presence of matter is rendered certain by fluctuation, when a free incision should be made, and the wound treated by antiseptic lotions.

Owing to the difficulty of opening the jaws, fluid nourishment is essential for several days until the swelling subsides. Where there is much increase of temperature and constitutional disturbance, a mixture like the following may be given:

℞.—Tinct. aconiti ♏ x.
Liq. ammon. acet. ʒj.
Tinct. croci ʒj.
Aquæ camph. ad ℥ij—M.

S.—A teaspoonful to be taken every second hour.

The complications are to be treated upon general principles, and there is still among the older practitioners a belief in the metastatic nature of the orchitis, meningitis, or ovaritis, which leads them to apply a smart sinapism or sharp counter-irritant to the parotid region when they notice signs of metastasis.

MYALGIA—See Rheumatism, Muscular.

MYELITIS.

The treatment of this affection will for the most part embrace the management of whatever factor has caused the inflammation of the cord, as often the myelitis will be found to be secondary to injuries, wounds, diseases involving the spinal structures, hemorrhage, or spinal leptomeningitis. From whatever cause, rest as near to being absolute as possible should be insisted upon from the onset of the first symptoms. The best position is the horizontal. The nursing is of the utmost importance, and a water bed is of greatest use, and in some instances it is essential for the prevention of bedsores.

Cold to the spine by means of the spinal ice-bag is the safest remedy which our present knowledge can supply. Where there is great pain and tenderness a dozen leeches may be applied in two or three places

on each side of the spine, and, after they fall off, cupping-glasses may be applied over the bites with great advantage in some cases. The cautery or blisters are sometimes recommended.

Drugs are not to be much depended upon in acute cases, but sometimes mercury has been found to do good. It should be given in small doses, and the bichloride is the best preparation. Salivation by inunction is contra-indicated in the great majority of cases. Ergot, though theoretically indicated, has rarely been found to do much good. More may be expected from large doses of iodide of potassium.

Galvanism is indicated after the acute symptoms pass off. The continuous current from fifteen Leclanché elements may be used by placing one large moistened electrode over the cervical spines, and the other over the lower part of the spinal column. The electrodes should be not only thoroughly saturated with liquid, but they should be warm. A strong solution of common salt in hot water answers perfectly. Ten minutes will be long enough for each *séance*. The electrodes should be moved up and down the spine, and the applications need not be more frequent than twice in the day.

At a later stage massage and faradization of the wasted muscles, with phosphorus by the mouth, and strychnine injected into the muscular substance or subcutaneously, may be of the greatest benefit.

The treatment of bedsores, which are so prone to occur, is of the utmost importance, and the remedies which are available will be found under Bedsores. The state of the bladder will require the closest attention, and fetor in the urine should be instantly met by the internal administration of 10 grain doses of boric acid. With this remedy the washing out and injection of the bladder by antiseptics is now generally unnecessary. The softer rubber catheter lubricated with glycerin of borax should, when possible, be used to relieve retention of urine.

MYOPIA.

Attention should be paid to the amount and nature of the work imposed upon the myopic eye. If more attention was paid to the printing, type, and paper entering into the ordinary school-books, and if the "result fees" system was done away with, there probably would be less myopia. Where pain or aching follows the use of the eyes all school work should be given up entirely for a short period, and after the complete rest has removed these symptoms, shorter school hours, better print, and clearer light should be provided.

The optical treatment will consist in the proper selection of suitable concave glasses. These will consist in spectacles or eye-glasses for distance and for reading. These latter, as a rule, are better to be a little more than half the full correction, except in very low degrees of myopia, when glasses which fully correct the error may be used. In the higher degrees it is a good plan to disorder the accommodation by instilling atropine, so as to prevent the otherwise powerful efforts at accommodating. In very mild cases, resulting from overwork, especi-

ally when the eyes have been long and persistently fixed upon minute objects, and where myopia may be said to be commencing, the proper treatment will be to insist upon proper rest to the eyes and the instilling of a drop of weak eserine solution every night for a couple of months.

MYXŒDEMA.

As the pathology of this rare and highly interesting affection is being steadily cleared up, there is some light at length being thrown upon its treatment. By measures directed to the general health, and to those agents which improve the appetite and digestion, much may be done to prolong life. It is of considerable importance that the functions of the skin should be most carefully attended to, and the patient should be clad in flannel from head to foot. It is a significant fact that in those cases where remedial agents have been found to retard the progress of the disease, their rationale may be explained to a great extent by their diaphoretic action. Thus, the various forms of hot, warm, or vapor baths persistently employed have been followed by improvement, and Ord and Sir Andrew Clarke have met with such results.

Jaborandi, in full doses, has caused the symptoms almost to disappear in the experience of Ord.

Arsenic, chloride of gold, and other alteratives have been unsuccessfully tried. Many able workers at home and abroad have been laboring in this interesting portion of the field of therapeutics, and the results are highly interesting, and promise to throw considerable light upon the pathology of the disease. Thus, Horsley, independent of Bircher and Kocher, has pointed out the value that might possibly accrue in operative myxœdema or cachexia strumipriva by transplanting normal thyroid tissue. The suggestion has been put to the test of experiment with results that warrant a hope of the possibility of curing myxœdema.

In a case where a severe form of the disease followed the unintentional removal of the *entire* thyroid gland, Bircher transplanted into the abdominal cavity a portion of the tissue (which appeared to be normal) from a goitre, improvement set in and was maintained until atrophy of the graft took place. The operation was afterward repeated, and the future of the case will be followed with interest. Meanwhile, the benefits of transplantation have been established. Horsley points out that with our recently acquired knowledge of the functions of the thyroid, the cachexia strumipriva will, of course, disappear as the operatian of *entire* excision is abandoned, and he believes the operation of transplantation will be always indicated in ordinary myxœdema and sporadic cretinism.

Where it is better to transplant goitrous human tissue or healthy thyroid from lower animals into the abdominal cavity, loose or attached to some part of the parieties, is yet to be settled. Lannelongue has

recently transplanted sheep's thyroid into the subcutaneous thoracic tissue of a cretin with results not yet determined. Recently, an extract from the sheep's thyroid has been successfully injected hypodermically.

NÆVUS.

The treatment of these growths is capable of endless variations, but before any operative measures be determined upon, due consideration must be given to the fact that many of these marks disappear after spontaneously shrivelling up. Where the nævus is small, superficial, and upon the trunk or covered parts of the limbs, it may be left as long as it remains stationary. Even when on exposed parts, an operation should be only decided upon after waiting some time, unless the growth is deep or showing signs of spreading, or where it is unsightly, and has remained so for so long a time as to negative the hope that spantaneous cure may result.

The means of treatment to be adopted will depend upon the size, depth, and locality of the nævus. Thus, when situated upon the trunk, some method which will effect its speedy removal without much regard to the size of the cicatrix, is to be preferred to the slow and often tedious plans, which, for the sake of sightliness, must be selected when the face is the seat of the affection. If the surgeon determines to attack the growth without destroying or cutting the skin, a host of plans have been tried and recommended, many of which, such as pressure by bandaging, or by the constricting effect of painting on collodion and astringents, by applying cold by means of ice, ether sprarly etc., are utterly useless.

Measures with the view of exciting adhesive inflammation or coagulation of the contents of the tumor, so as to seal up the vascular tissue of which it is composed, offer many advantages. Those will be enumerated which have most frequently been found successful.

Blistering by cantharides, croton oil, tartar emetic, chloral, corrosive sublimate in strong solution, saturated alcoholic solution of iodine, or strongest liquor plumbi has been practically abandoned in the face of surer methods; and the same may also be said with nearly equal truth of the old method of vaccinating the child with vaccine lymph. over the situation of the nævus.

The method of injecting various substances into the interior of the tumor to cause coagulation or inflammation, at one time so much praised, is now steadily becoming obsolete, owing to the great danger of injecting the agent into the circulation and causing sudden death by the formation of emboli. Solution of iron, iodine, ammonia, tannin, nitrate of silver, and pure carbolic acid, creasote, or absolute alcohol have all been tried, and by most surgeons rejected, notwithstanding the recommendations to apply a clamp or ring round the nævus, or to break up the interior of the tumor with needles, in order to prevent such accidents.

Of much the same nature is the plan of inserting setons or irritants.

as threads and hot needles, into the tumor, and the result is, though less dangerous, about equally unsatisfactory.

The only really reliable and unobjectionable method of exciting coagulation in the tumor is by electricity, and it affords, after all, by far the most satisfactory all-round plan of treating nævoid growths with safety and with the minimum of disfigurement. It is generally spoken of as the electrolytic method, or the method by electrolysis; but, as pointed out by Duncan, this is a misnomer, for whether the results are obtained by neurotic, vascular, trophic, or osmotic action, it is not by the decomposition of fluids and solids at the poles of the battery as in Apostoli's plan of treating uterine fibroids. The writer has seen the true electrolysis used many years ago (1873) for nævoid growths, but the result was complete failure.

The best way to proceed to insert a needle connected with the positive pole of a battery consisting of ten large Leclanché cells. The needle should be insulated, and after being once introduced through the skin, need not be removed or withdrawn until the operation is completed, but its point can be moved about so as to submit the different parts to the electrical influence. The hand of the operator holding the needle should not be depressed while the current is flowing, as it is desirable that the point of the needle should not reach or penetrate the delicate cutaneous covering of the nævus. The kathode is placed upon the healthy skin just outside the margin of the growth, and in this way, by inserting only one needle, the minimum of scarring is secured, especially as it is found almost impossible to insulate the needle so completely as to prevent injury of the skin. When too strong a current is used, or when the negative pole is introduced, the puncture may remain as a disfiguring brown spot. It is at first advisable to begin with five or six cells. The length of the *séance* will depend much upon the size and nature of the growth. Some small nævi may be caused to shrivel up and disappear after one application of the current for a few minutes. The operation should be concluded as soon as the skin appears to swell up a little, and the color of the tumor changes to a dusky hue, when the needle may be rotated slightly between the finger and thumb before being withdrawn, a little collodion being painted over the puncture.

The number of application can only be determined after watching the results. As a rule, these are much better when the progress of the case is allowed to proceed at a slow pace. Once a week may be tried, or, if the nævus is very large, a different part of it may be submitted to the action of the current every three or four days, but it will be well occasionally to leave long intervals between the applications in order to encourage the slow contraction of the vascular walls.

Some operators prefer to introduce two needle into the growth, one being attached to the negative and the other to the positive pole of the battery, and some surgeons prefer to work the negative pole owing to the greater intensity of its action, and different metals are sometimes

recommended, but, as a rule, for ordinary small nævoid growths the insertion into the tumor of an insulated steel needle connected with the positive pole is the best for all practical purposes. As already remarked, there is no advantage in using a strong current which decomposes or electrolyzes the contents of the tumor, as recommended by some who use Stöhrer's battery. In this way not only ordinary nævi, but deep and extensive cavernous angeiomata and cirsoid aneurisms may be effectually dealt with which are beyond the reach of art by any other method. Port wine marks are, however, little influenced by electrolysis.

Ligature, though generally successful, is a very painful operation, and the various plans of subcutaneous ligature are not always satisfactory. The destruction of tissue is so extensive, and the subsequent cicatrix so unsightly, that about the face the operation should not be undertaken, especially as the contraction of the cicatrix may seriously interfere with the normal positions of the eyelids and lips.

Upon the trunk the writer has employed the ligature with good results by passing underneath the growth two hare-lip pins at right angles to each other, and tying firmly the tissues by a stout silken thread, after which the pins may be immediately withdrawn, though he prefers to leave them *in situ* for twenty-four hours. After the strangulated growth falls off, the raw surface may be treated as an ordinary sore by antiseptic dressings.

Destruction of the growth by the application of such caustics as chloride of zinc, potassa fusa, Vienna paste, arsenic, etc., is most painful and unsatisfactory, and should only be undertaken in very exceptional cases. The same remark applies to the use of the actual or thermo-cautery, and to the method of inserting needles, which are afterward to be heated by a spirit lamp.

Nitric acid may, however, be painted over *very superficial* nævi with success. Ethylate of sodium has been introduced as a remedy for the treatment of nævoid growths, and as there appears to be much uncertainty or difference of opinion regarding the methods of using it to best advantage, it may be advisable to quote the words of Richardson himself. The writer has successfully employed it for the destruction of small cutaneous or superficial growths.

"As a rule, I employ the sodium ethylate in practice, but I have many times employed the potassium salt in cases where it was important to destroy a structure very promptly. Whichever of the preparations is employed it should be in a solution made by saturating the alcohol with the element until a solution of sp. gr. 0.880 is obtained, or by the addition of absolute alcohol to the crystallized salt until a solution is made of the same specific gravity. This solution should be kept in a cool place, apart from the light. Originally I recommended that a glass rod should be used in applying the solution, and with the potassium ethylate this is still advisable, but with the sodium solution it is not necessary. A good camel's hair pencil is all that is required.

In treating nævi I first dry the surface with a piece of cotton-wool; then with a brush I thoroughly coat the dried surface with the solution. The application causes always some effusion and redness, accompanied by a little pain, expressed by those who are old enough to describe it as a burning sensation like the sting of a bee or of a nettle. After a short time there is an exudation of water, in drops, from the red surface, which exudation lasts for a few minutes, and is followed by dryness and sometimes by pallor or duskiness of appearance. In the course of four or five hours a scale begins to form, and continues until there is quite a hard crust, which completely covers the nævus, but through which the soft vascular character of the swelling can be detected. Originally after it was formed I allowed the crust to remain for a few days, then removed it with a wire scoop, and re-applied the solution over the red surface. The proceeding led to a rapid cure, but it was so painful as to demand the use of a general anæsthetic. I have therefore, given this up for a mild and sure, but rather slower method. After the first crust is fully formed I pass through it, on the third day, a fine needle, with cutting edges shaped like the old cataract needle, and with this I break up the vascular surface underneath, and on withdrawing the needle make firm pressure with lint on the upper surface. A large drop or two of blood flows out freely, but further escape is easily controlled by a dossil of lint charged with styptic colloid. When the bleeding has quite ceased a drop of ethylate solution is inoculated into the nævus through the punctured opening, a new layer of it is painted over the crust, and the crust is left as it was. The crust may be left four days more, and if at that time the vascular softness still remains under it, it must be treated by puncture and re-injection just as before. When at last the crust feels firm and dry beneath, the cure may be considered as complete, and the crust may be left to scale off by itself leisurely. In the treatment of raised nævus by this plan I have never seen the least untoward symptom of moment, and although some cases have been rather more tedious than others, there has not been one failure of cure. In fact, I have come to look upon the method as specific for the ordinary raised circumscribed nævus. In respect to the smooth, diffused nævus, commonly called "mother's mark" or "port wine stain," I have not so good a report to offer."

Excision or enucleation may be practised with much advantage in the case of nævi upon the trunk. The loss of blood is for the most part trifling, some growths shelling out without any hemorrhage. The results are rapid and satisfactory. Where the nature of growth appears to be arterial, or where there is suspicion of an element in it of aneurism by anastomosis, if the knife be at all used it must sweep clear of the growth.

NAILS, INGROWING. See page 398.

NASAL POLYPUS—See Polypi.

NAUSEA—See under Vomiting, Dyspepsia, etc

NECROSIS.

The cause of the bone mischief must receive attention from the first. If, for example, syphilis has been the probable starting-point, remedies directed to this affection should be administered. Antistrumous remedies are indicated in a large percentage of cases, and when the lower jaw is the seat of the necrosis from phosphorous fumes, the patient should be urged to give up his occupation. As the drain upon the system is certain to be both severe and long, attention should be most carefully paid to the diet, purity and abundance of air, and proper rest. When abscesses form they should be opened early. This is especially true when the matter forms under the periosteum. The incisions should be free and deep. With these measures—*i. e.*, rest, feeding, opening of abscesses, the remedies directed against the primary cause the disease—the surgeon must wait while nature performs her part in separating the living from the dead bone, operative interference at this stage being bad practice. Where the sequestrum is superficial, as in exfoliation, its removal is easily accomplished by enlarging the sinus and incising the soft parts, when it may be grasped by a stout pair of dressing or necrosis forceps, or it may be pried out of its bed by inserting a strong probe or director under its freest extremity.

When the sequestrum is central or lying free in the interior of a long bone, surrounded by dense ivory-like tissue, its removal may present serious difficulties. The writer has seen a large loose sequestrum in the shaft of the femur defy the skill of several surgeons. In such cases Esmarch's bandage being applied, under chloroform the sinuses in the soft parts may be slit up freely, so as to thoroughly expose the cloacæ in the healthy bone. These must be enlarged before any attempt can be made to extract large sequestra, the gouge, chisel, and mallet, or the bone forceps may be used, but in many instances it will be better to trephine in the neighborhood of the two largest cloacæ and connect the apertures so produced by two parallel incisions made by means of a Hey's or a straight saw. In this way a small quadrilateral plate of bone with concave extremities may be removed, leaving a little window in the healthy shaft, through which the sequestrum can be pulled out. Should the sequestrum refuse to be dragged or extracted through this opening, it may be seized in its centre by a pair of cutting bone forceps, and divided in two or more pieces which are easily removed by dressing forceps.

The smooth cavity out of which the dead bone has been extracted may be plugged by iodoform or sublimate gauze, to restrain the hemorrhage which occurs after the removal of the Esmarch's bandage. The wound is then treated upon antiseptic principles, and recovery is generally rapid and satisfactory. As a rule, it may be said that unnecessary injury to the healthy *bone* is more likely to follow prolonged attempts at extracting the sequestrum through narrow cloacæ

than by the free division carried out by means of the trephine and saw. The writer at one time had considerable experience of this operation in a children's hospital, and never saw any permanent weakening of the limb follow the use of the trephine and saw. (See treatment of Acute Necrosis under Periostitis.)

NEPHRITIC COLIC—See Stone in the Kidney.

NEPHRITIS—See under Bright's Disease.

NEPHROLITHIASIS—See Stone in the Kidney.

NETTLE RASH—See under Erythema.

NEURALGIA.

The treatment of neuralgia will resolve itself in the first place into the removal of the cause, when this can be discovered, and with this object in view the physician must search diligently for any departure from the ordinary healthy standard, and having found it he should proceed at once to correct it with the hope that its removal may be followed by the disappearance of the nerve trouble. Such rational treatment in no way interferes with the various methods by which pain is to be relieved. It cannot be too strongly stated that though the temporary relief of suffering should play an important part in the treatment of the various neuralgic conditions, it should not be regarded as the chief or sole principle upon which the physician should approach the management of a case of severe neuralgia, though it is true that he may find in some cases no other indication for treatment.

It is also not to be lost sight of that smart neuralgia may persist after the removal of the cause, which, in the first instance, induced the neuralgic condition in the nerve trunk or its branches, and this consideration should prevent the very common mistake of flying from one remedy to another in quick succession without waiting a sufficient time for that steady and continuous action of the drug which may be crowned by permanent success. It is only after the evident failure of such rational treatment, that the scientific physician will feel justified in resorting to the various empirical methods which experience may lead him to hope as likely to prove useful.

Among the departures from health standing in the relation of probable causes of neuralgia is anæmia. It is the experience of every physician that anæmia and neuralgia often occur together, and that no treatment sometimes will give any permanent benefit until the anæmia is removed, hence in every such case iron is indicated. The scale preparations, the tincture, saccharated carbonate, Blaud's pills, or other preparation may be given according to the special indications present. Occasionally, indeed, it may be necessary to give one preparation for a time, and follow it up by another until the system is saturated with iron. As a rule, small doses of iron are useless, and in this

respect the treatment of neuralgia by iron preparations is upon the same footing as is that of chlorosis, in which affection doses much greater than can be assimilated appear to be necessary to produce the best results. In another important respect chlorosis and neuralgia agree—the treatment must be continued for a considerable period after the symptoms of the diseased condition have passed off, otherwise relapses are almost certain to occur.

The following pills may be given for a considerable period:

℞.—Ferri reducti gr. iv.
Quininæ sulphatis gr. ij.—M.

Make 24 of these pills.

S.—One pill to be taken three times a day after meals, and two to be taken at bed hour.

Arsenic is a drug of the greatest value in neuralgia, especially in the very chronic or obstinate forms. Like iron, it must be given in full doses for long periods, and be continued for a considerable time after the painful paroxysms have passed off. It is, moreover, a valuable drug in cases not characterized by marked anæmia, and the writer generally gives it in combination with iron, or during the intervals when the administration of iron is suspended. The arseniate of iron may be given in a pill in doses of $\frac{1}{8}$ grain in combination with quinine, or it may be added to the above formula.

Errors in nutrition must be remedied by improved dieting, by the administration of large quantities of nourishing food as often as the appetite and digestion will permit. Every means whereby these latter can be improved is to be carefully attended to, by tonics and peptonized foods when necessary. Some cases of neuralgia which have resisted all treatments have been known to yield to overfeeding.

Massage, in as far as it powerfully stimulates appetite and digestion, is a valuable aid in the treatment of neuralgia.

Insomnia, diminished amount of sleep, the fagging of overwork, high pressure, grief, and anxiety demand prompt and radical measures before the ordinary routine remedies can have a fair chance.

Gouty, rheumatic, or malarial conditions of the system should be met by alkalies, colchicum, salicylates, iodides, salol, quinine, or other recognized agents. Syphilis is to be met by mercury. Lead poisoning, which not infrequently is the cause of neuralgia, calls for appropriate management, in which iodide of potassium should hold a prominent place.

Menorrhagia and uterine mischief may be the cause of abdominal and other neuralgias. Sources of irritation, which by reflex action may be the exciting cause, should be diligently sought for. Thus affections of the ear and nasal bones, or the irritation of carious teeth, may cause neuralgia of the fifth nerve, while rectal, anal, or pelvic irritation may give rise to sciatica. The effects of cold and damp

applied to any region of the body may excite neuralgia in distant nerves. Thus wet feet may induce facial pain, and, as a general rule, warm clothing and the avoidance of sudden variations of temperature are of as great importance in the management of neuralgia as is an abundance of pure fresh air and sunlight, with outdoor exercise and freedom from worry, or other source of nerve exhaustion.

The treatment of pain during the paroxysms will call for prompt and powerful anodynes.

Morphine or opium and their preparations are foremost among these. To be of use in relieving the pain of an attack, the narcotic should be given in a full dose. It may be administered by the mouth or hypodermically; the latter method is decidedly to be preferred. When the affection is not of long standing, there is some reason to hope that morphine may prove curative. The experience of every physician shows that in a small percentage of cases pain does not return after being once subsided by a good opiate, and there are strong reasons for believing that this is the result of the opiate, and that the cessation of pain is not owing to the natural decline of the disease. The writer has several times satisfied himself of the truth of this statement, especially when treating neuralgia of the sciatic nerve.

Another important fact may be here emphasized—*i. e.*, that this happy and desirable result is more likely to happen when the opiate has been injected into the immediate vicinity of the affected nerve than if administered by the mouth. In closely examining this statement, it may be fairly supposed that the acupuncture is an important element in the treatment, since excellent results have sometimes been obtained by simple puncture of the affected nerve trunk by a stout needle.

Acting upon this theory of the duplex nature of the action of the hypodermic method of treating neuralgia, the writer has obtained most encouraging results by combining the acupuncture and opiate treatments more closely than is ordinarily attempted. Thus he takes a quantity of solution of morphine (1 : 10) for hypodermic use, say 4 minims, and dilutes this with the full of the ordinary syringe of distilled water, making in all 20 or 30 minims of liquid. This he injects in several places *deeply* along the course of the affected nerve, aiming at a puncture of the nerve trunk at each insertion of the needle, which should be made at right angles to the surface when the nerve lies deep. In sciatica, he is certain that this is the best of all methods of treatment.

Where this plan is likely to succeed, the result will soon be evident, and the physician must be always upon his guard, lest the opium habit becomes established during the management of a case of rebellious neuralgia by powerful anodynes. This much can be said for the plan now advocated—that the risks of the opium habit are decidedly less than if the drug be administered by the mouth, or by the hypodermic method as usually practised.

Another important advantage can be claimed for it—viz., that during

the intervals between the paroxysms any of the numerous methods of treatment about to be mentioned can be pursued without let or hindrance. The plan of administering opiates during the intermissions, as advocated by some, is not to be recommended; but when the attacks of pain are known or expected to come on at a certain hour, they may be occasionally forestalled by a full opiate administered by the mouth. The opiate may also be combined with some other remedial agent, as quinine, chloride of ammonium, etc.

Before proceeding to detail the numerous other plans of treating neuralgia which might accompany or follow the use of opiates, it will be more convenient to briefly review the list of drugs which have been from time to time employed in the treatment of this affection; and in detailing their uses, unless when otherwise stated, neuralgia of the face is supposed to be the condition generally before the writer's mind.

Chloride of ammonium may be taken as the type of the so called neuralgia specifics. It has been found by experience that full doses have the power of relieving the pain and preventing the return of the paroxysms in some instances of facial neuralgia. How it acts in some and why it fails in the majority of cases we do not know, nor can we tell in what cases it will prove successful until it is tried. The same remarks will apply to almost the entire list of anti-neuralgic remedies; and in severe and obstinate cases of the disease the physician will be obliged to humiliate himself and become a mere empiric, prescribing one drug after another until he finds the one which removes the affection. Twenty grains in solution may be given every two hours for three doses, then every four hours, and as a rule, if relief be not obtained in twenty-four or thirty-six hours, the remedy may be abandoned. It has been found useful in some instances of intercostal, visceral, and sciatic neuralgia, and may be given in combination with the following:

Quinine, as already mentioned, should be employed in neuralgia of malarial origin. It is, however, often of the greatest service in cases where there is no reason to suspect malaria, and with some physicians it is the first remedy which they prescribe in all cases, no matter what nerve may be affected. If there be any special indication for its use, it may be said to be most likely to prove successful in those neuralgias which tend to exhibit some element of periodicity, though not necessarily of malarial origin. Less than 5 grains is useless, and 10 grains may be given every 6 hours in wafer paper. As a rule, it is not necessary to push the drug until cinchonism is produced, but in obstinate cases this may be done before giving up the remedy.

By giving it before the expected paroxysm, this may sometimes be effectually forestalled. This result is, however, more likely to be obtained in malarial cases. In neuralgia of the supra-orbital branch of the fifth nerve, quinine is perhaps the best remedy which we possess; and in patients who cannot tolerate the drug well, 1 grain may be given every forty minutes in solution until five or six doses have been administered.

The following mitrailleuse may be tried in obstinate cases:

℞.—Quininæ sulph. gr. v.
Morphinæ hydrochlor. gr. ½.
Ammonii chlor. gr. xv.—M.

S.—One powder, wrapped up in moistened wafer paper, to be taken every six hours, after food.

ANTIPYRINE, ANTIFEBRIN, PHENACETIN, and SALOL may be given in all forms of neuralgia, and sometimes they act with remarkable rapidity, though the same success is not to be expected as in the treatment of migraine.

Ten grains of antipyrine may be given as soon as the paroxysm begins, and 5 grains every two hours afterward for three or four doses. As a rule, if relief is to be expected at all, it will follow before 20 or 30 grains have been administered. In patients suffering from any form of neuralgia who are also migrainous these remedies appear to act remarkably well. The writer's usual formula is the following; it is especially valuable in visceral neuralgia:

℞.—Dimethyloxychinolin ℥ij.
Ext. erythrox. fld. ℥ij.
Codeinæ gr. vj.
Glycerini et aquæ ad ℥iv.—M.

S.—A small teaspoonful to be taken in a wineglassful of water after meals four times a day.

Salol and phenacetin may be given in 10 grain doses every four, six, or eight hours.

EXALGINE, the newest of the analgesics, has been used by Fraser with success in various forms of neuralgia. The writer has used it in several cases of neuralgia in various regions, and though further trials of the drug are necessary before any very decided judgment can be formed, it appears to give relief without very materially diminishing the tendency to future severe paroxysms. This may not be the result when larger doses are administered. The writer did not exceed 1 grain every three or four hours, dissolved in a tablespoonful of water.

CANNABIS INDICA has been much employed in neuralgia. It does not appear to possess properties differing much from opium or morphine, but it is a valuable drug when for any reasons these are contraindicated. It is more efficacious in neuralgias of the pelvic organs and in neuralgia occurring in migrainous subjects. One-half to ¾ grain of the extract may be given in pill every four or six hours.

GELSEMIUM is one of the best remedies which we possess when the affection is confined to the dental branches of the fifth nerve. It appears also to act more powerfully when the lower jaw or alveolar processes are the seat of the trouble. It affords relief in some cases,

even when the teeth are carious and when the pain is arising from them. In one sad case which fell into the writer's hands after every tooth in the upper and lower jaws upon one side had been fruitlessly extracted from time to time during years of agony, gelsemium gave the first relief which the patient had enjoyed for nearly half his lifetime.

It must be given in doses bordering upon the dangerous in some cases, and the writer found a patient holding on to a lamp-post in the street unable to articulate and suffering from ptosis and diplopia, after taking two doses of $1\frac{1}{2}$ grains each of the B. P. alcoholic extract which had been ordered for neuralgia of the fifth nerve. The B. P. dose of 2 grains is dangerous. There is much difference in the susceptibility of different patients, and, as a rule, it is well not to exceed the dose of 1 grain of the extract or 20 minims of the U. S. P. tincture until the patient has taken the drug for some time. These doses may be repeated at intervals of two hours until a painful feeling is experienced in the brows and eyeballs, followed by giddiness and some ptosis. As a rule, it is not safe to push the drug after ptosis has been noticed, or when the patient complains of double sight, or when the least staggering of his gait has been observed. The mental faculties not being in the least affected by poisonous doses, the physician should not be misled by the clear and rational demeanor of the patient. Ringer has given drachm doses of the tincture every hour for six doses, with slight disturbance.

Chloral has been recommended, but it almost always fails in neuralgia. It is of some use, however, when applied locally, as will be mentioned further on. Success occasionally has been achieved by administering a combination of chloral and morphine; but such a combination is likely to succeed only in cases which probably would yield to safer drugs, and this combination is believed to be a dangerous one by several physicians.

Croton-chloral or butyl-chloral hydrate is a remedy of the greatest value for neuralgia of the fifth nerve. Ringer states that for facial neuralgia it is the most efficacious remedy which we possess. He uses it in the neuralgic pains arising from carious teeth, in the obstinate and severe facial attacks in old people, in neuralgia of the back of the head, occiput, and neck, and in migrainous shooting pains extending from these regions toward the shoulders. The writer has been generally disappointed in the use of this remedy, except when administered for pure neuralgia of the fifth nerve, when it very often succeeded in relieving pain and afterward inducing sleep. For visceral neuralgia it appears to be useless. Ten grains may be given, and 5 grains repeated every two hours for three or four times. The pilular form is the best, and gelsemium may be combined with it either in the form of extract, $\frac{1}{2}$ grain, or of gelsemia, $\frac{1}{200}$ grain. This latter is Ringer's favorite method. He gives a pill containing $\frac{1}{200}$ grain of gelsemia and 3 grains of croton-chloral every quarter of an hour for

six or eight doses, then hourly. The writer has never had the courage to employ these drugs in such liberal doses. Liebreich has, however, recommended the croton-chloral as a harmless soporific, suitable even in heart disease, in doses of 60 grains.

It may be administered with advantage in combination with Indian hemp, thus:

℞.—Butyl-chloral hydratis gr. v.
Ext. cannabis indicæ gr. ½.—M.

Make twenty-four such pills.

S.—One pill to be taken every three hours.

Atropine and belladonna, though more frequently used locally, are, nevertheless, of use often in neuralgia. The writer has found them much more valuable in abdominal or pelvic than in facial cases. In sciatica he has occasionally seen atropine succeed when given hypodermically in combination with morphine, when this drug had previously failed without the atropine; and, since it diminishes the dangers which sometimes follow upon the injection of morphine, it is a wise rule always to combine 1 or 2 minims of the 1 in 100 solution with every hypodermic dose of morphine. Trousseau's plan of treating neuralgia consisted in administering ⅓ grain of extract of belladonna every hour until giddiness was produced, when he lessened the dose and prolonged the intervals for several days.

Belladonna may be given in the pilular form combined with most of the drugs already mentioned. The following is a valuable combination for visceral neuralgia:

℞.—Ext. belladonnæ gr. ⅓.
Ferri arseniatis gr. $\frac{1}{12}$.
Codeinæ gr. ⅙.
Acetanilidi gr. iijss.—M.

S.—One pill to be taken three times a day after food.

Hyoscyamus, stramonium, and hyoscine act in the same way as belladonna.

The following combination of these drugs may be tried:

℞.—Tinct. hyoscyami
Tinct. stramonii } āā ℥iv.—M.
Tinct. belladonnæ

S.—Twenty-five drops to be taken in a tablespoonful of water three times a day after meals.

Iron and arsenic have already been spoken of when detailing the treatment of the causes of neuralgia. They are often of great value in cases where no evidence of anæmia exists, and a severe case of neuralgia

will seldom come before the physician which will not require either or both of these remedies at some stage of its progress. It will be generally necessary to saturate the system with them in slow or chronic cases, toward their termination, when the pain has been subdued with anodynes.

Since most of the remedies already mentioned are only indicated while severe paroxysms of pain are present or threatening, it will follow that there are intervals more or less prolonged in which the administration of the remedy is suspended. In the majority of cases time should not be lost, and in these intervals iron preparations, or full doses of Fowler's solution, arseniate of iron in pills, or Fowler's solution in combination with the tincture of chloride of iron, and quinine, should be steadily administered after each meal. In this way the return of the paroxysm is rendered less certain, and these drugs should be continued long after the pain has subsided.

Phosphorus is a remedy which in the affection under consideration appears to act pretty much like the drugs just mentioned. The indication which is regarded as especially pointing to the administration of phosphorus is evidence of brain or nerve exhaustion resulting from excessive and prolonged mental work under high pressure; and in uncomplicated neuralgias affecting any region of the body in elderly people, phosphorus in full doses ($\frac{1}{50}$ to $\frac{1}{25}$ grain) four times a day, often works well. One-twelfth grain doses have been often given by some, but the writer has seen unpleasant symptoms follow doses of half this amount, and it is a drug whose action should be watched from time to time during treatment of a prolonged attack, as a rule, $\frac{1}{50}$ grain may be given three or four times a day for several weeks or months without risk. It can be advantageously combined with strychnine or nux vomica.

Phosphide of zinc ($\frac{1}{12}$ grain) may be employed instead of the free element.

The Hypophosphites, in the form of Fellow's syrup, are very valuble adjuncts to the treatment of neuralgia, though it is hardly necessary to say that as they contain no free phosphorus, their efficacy does not depend upon this substance; and the same remark applies to phosphoric acid, to the syrups of phosphate of iron, of Parrish, and of Easton.

Zinc preparations are often of use in the treatment of the various neuralgias. The best of them is the valerianate, and it is especially indicated in hysterical cases and in examples of the disease where the head and face are affected, and where periodicity is more or less marked. Less than 5 to 8 grains in one dose need not be given. It may be administered in the form of pills containing 3 or 4 grains each, or it may be combined with as much quinine, and may be swallowed in moistened wafer-paper. Often the stomach rejects the dose, but the writer has seen it succeed in neuralgia which had proved rebellious to many other drugs. Other valerianates may be tried, and the quinine

iron, and ammonium salts have each their advocates. Valerianic acid and valerian root also are occasionally found useful.

The following pill is useful:

℞.—Quininæ valerian.
Ferri valerian. } āā gr. jss.
Zinci valerian.
Ext. gelsemii gr. ¼.—M.

Make 24 of such pills.

S.—One pill to be taken three times a day, after food.

Caffeine, theine, guaranine, napelline, cocaine, conium, codeine, narceine, strychnine, ergotin, sumbul, must be included in the list of anti-neuralgic remedies. Their indications are, however, very unsatisfactory, and like many members of this class, they must be used more or less empirically when other drugs have failed. As a rule, these substances may be said to be more likely to succeed in visceral neuralgias than in affections of the nerves of the head, face, or extremities, except in the case of caffeine, which appears to relieve facial neuralgia when given in large doses, especially in migrainous subjects. A combination of codeine and strychnine is sometimes very useful in visceral neuralgia; it may be given in the following formula:

℞.—Ext. nucis vomicæ gr. ⅓.
Codeinæ gr. ⅔.—M.

Make 24 of these pills.

S.—One pill to be taken four times a day.

Saffrol and menthol have been given with success by Dana in neuralgia, in doses of 15 grains dissolved in alcohol, or in capsules.

Nitrite of amyl, nitro-glycerin, and other nitrites afford the best chance of success in cardiac neuralgic conditions, and inhalations of the amyl nitrite sometimes cut short the paroxysms of neuralgia of the fifth nerve.

Chloroform and ether may be used as inhalations to give speedy relief in desperate attacks of neuralgia in any nerve, but for obvious reasons such powerful and possibly dangerous methods of relieving pain must necessarily be very seldom resorted to.

Alcohol in large doses is open to the same serious objections; and though it is a drug of much value in intensifying the effects of other narcotics, the physician must be always upon his guard in employing it in affections liable to run a chronic course, as, like the establishment of the opium habit when morphine has been unwisely prescribed, the alcohol habit may be the terrible result of the physician's indiscretion in permitting the use of alcohol for the relief of pain.

Iodides and salicylates have been already referred to when detailing the treatment of the probable *causes* of neuralgia. The

iodide of potassium, however, often proves very useful in cases where there is no history or suspicion of a rheumatic element or of a syphilitic taint. To be of use, however, it should be given in full doses, and less than 5 grains, speedily increased to 10 or even 20 grain, three times a day, seldom proves beneficial. It is very valuable in some rebellious forms of sciatica; and generally speaking, its administration is most clearly indicated in those cases of neuralgia which are characterized by nocturnal exacerbations, though, as already mentioned, these need not necessarily be of specific origin. In neuralgia affecting the cardiac organ, and in the neuralgic pains apparently arising from the nerves which supply the long bones, the iodides are of great value. Iodoform is sometimes administered instead of the iodide of potassium, but it has failed in the writer's hands.

Chlorate of potassium has been reported as successful in facial neuralgia, but the writer has never seen any benefit from it.

Actæa or cimicifuga has been found to relieve neuralgia of the fifth nerve and of the ovarian nerves. It is sometimes very useful in neuralgic conditions associated with muscular rheumatism, and it may sometimes be combined with much advantage with iodides.

Bromides are of little use unless when given in combination with other agents. They may, however, be used freely in this way with advantage; and for the insomnia attending some cases, full doses of the bromide of potassium, given at night, with opium and iodides, are productive of much benefit. Anstie spoke highly of the value of large doses of bromides in cases arising from sexual excitement.

Tonga has been much praised as an anti-neuralgic remedy, and sometimes proves very efficacious in facial neuralgia. It is believed to be a mixture of the bark and leaves of various species of *rhaphidophoræ* and *premnæ* from Fiji. The dose of the liquid tonga is one drachm three times daily. Often it fails entirely.

Pulsatilla, piscidia erythrina, bebeeru, chelidonium, apiol, chamomile, veratrine (internally), digitalis, and hosts of other vegetable products have been used from time to time, but as most of them are now seldom employed, space need not be taken up with a discussion of their very doubtful merits as anti-neuralgics.

Local measures for the relief of neuralgia will be now briefly referred to, though it must not be inferred that their employment is only to be undertaken after the failure of the previously-mentioned methods of internal treatment. In some cases purely local treatment may succeed, but, as a rule, it should be employed at the same time, and as auxiliary to the internal administration of some of the remedial agents already detailed.

Acupuncture has many advocates, perhaps chiefly among surgeons, and the writer, though he never employs this remedy alone, has seen very decided benefits follow its use in the hands of others. It is indicated in sciatica, and occasionally its effects prove as rapid in acute cases as they do in lumbago, but like almost every other remedy used

in neuralgia, acupuncture fails utterly in many cases. A stout needle should be driven deeply into the tissues in several places over the course of the affected nerve, which should be punctured at each insertion. There does not appear to be any advantage in allowing the needle to remain *in situ* for any length of time. Acupuncture of corresponding painful spots upon the opposite side of the body has been reported as successful.

The writer's method of combining acupuncture with the hypodermic injection of a weak solution of morphine into the affected nerve, has been already referred to upon page 523, and he may here repeat that he believes it to be the most efficacious combination of local and constitutional methods at the disposal of the physician in dealing with obstinate neuralgias. He generally combines with the dose of morphine $\frac{1}{50}$ grain of atropine.

Aquapuncture, or the deep injection of a small quantity of pure water into the nerve or its immediate neighborhood, has also given good results.

Osmic acid has been strongly recommended as an injection in sciatica, and the writer has employed it very many times in obstinate cases with success. Billroth has found it to cure sciatica which had resisted all treatment for years; he injected it deeply between the ischium and trochanter. The writer takes 15 minims of a freshly-prepared 1 per cent. solution of the acid, and dilutes this quantity with the full of a large hypodermic syringe of distilled water; he injects this deeply into the nerve, in half to one dozen places, from the ilium to the heel, introducing 1 or 2 minims with each insertion of the needle.

Of course, the nerve trunk and its branches are often missed, the needle passing right through them or falling short of them in some cases, but the physician should aim at lodging the injection in the nerve substance. It is evident that the success of this vigorous treatment may be altogether owing to the numerous acupunctures independent of any virtue possessed by the osmic acid. In using the hypodermic needle for acupuncture it is necessary to be careful lest it should break, as considerable force is generally needed in piercing the skin and deep tissues. There is no danger of such an accident if a short grip of the needle be taken by grasping it firmly between the finger and thumb, at a distance from the point supposed to correspond to about the probable depth of the sciatic nerve from the surface. It should be plunged in boldly, and if a little carbolic acid be previously painted over an area as large as a sixpence where the puncture is to be made, little pain will be felt.

Cocaine may be employed in exactly the same way, and $\frac{1}{4}$ grain may be injected in one or two places, though very much greater quantities have been injected without producing unpleasant results.

Antipyrine and other substances, such as carbolic acid, turpentine,

creasote, oils of peppermint and cloves, may be injected, but, as a rule, they produce great pain, and may possibly lead to sloughing.

Chloroform, injected in doses of 5 to 10 minims, has given excellent results in the hands of Bartholow.

Counter-irritation is a long-established method of treating the various forms of neuralgia, and the different ways in which it may be employed are almost endless, when we consider that nearly every substance capable of irritating or blistering the skin has been at some time or other advocated as a specific for neuralgia. Cantharides, either in the form of blistering collodion or as small circular or narrow strips of blistering paper may be used. The latter are certainly to be preferred, as they can be removed after a few hours' application in those cases where an effect short of real vesication is desired. They can be placed over the trunk or principal branch of the affected nerve. Thus, in sciatica, a blister 1½ inches broad by 3 long may be applied over the nerve as it emerges from the pelvis. In two hours the blister may be removed and placed over the upper part of the popliteal, where it may be suffered to remain for three or four hours.

Anstie laid down the rule that the blister should be applied over the posterior branch of the same spinal nerve trunk as that from which the neuralgic nerve springs.

In neuralgia of the face or scalp, relief may be obtained by applying a small circular blister over the temple or behind the ear and allowing it to remain on until complete vesication occurs.

The actual cautery is still by some preferred to blistering. Valleix, after etherization, passed it lightly along the course of the affected nerve so as to produce superficial eschars. Many cases yield to this treatment after resisting every other. Corrigan's iron may be used, after heating to a dull heat with the spirit lamp or it may be dipped in boiling water and pressed upon the part. By graduating the degree of temperature almost any effect from the mildest counter-irritation to the rapid destruction of the superficial tissues, may be produced. The thermo-cautery can also be used. Mustard poultices are highly recommended as a means of counter-irritating in neuralgia, though the writer has always chanced to see aggravation of the symptom produced by them.

Capsicum, in the form of the Chili paste, may be used with advantage in the very chronic cases.

The plan of causing rapid vesication by the application of strong solution of ammonia, and sprinkling morphine, strychnine, or other drugs over the excoriated surface, is now seldom employed.

Of local anodynes there are many which have proved useful. Thus—

Menthol, rubbed along the course of superficial neuralgic nerves, often affords speedy relief. The liniments of belladonna and aconite may be used in the same way, and chloroform may be combined with them. The writer has employed the following to paint over the skin covering superficial painful nerves, chiefly about the face and neck:

R.—Olei caryophylli ℥iv.
Olei menthæ pip. ℥iv.
Chloroformi purif. ℥ij.
Tinct. aconiti ℥vj.—M.

S.—To be used as directed.

Its application is often followed rapidly by marked relief, though, like most other anti-neuralgic remedies, it sometimes produces no effect at all.

ATROPINE, ACONITINE, and VERATRINE ointments are powerful local anodynes, and should be gently rubbed into the skin over the course of the affected nerves until numbness and tingling are experienced.

Intercostal neuralgia is said to yield sooner to the belladonna than to the aconite alkaloid.

CHLOROFORM, ETHER, COMPRESSED CARBONIC-ACID GAS, and METHYL CHLORIDE have been often found very efficacious in giving speedy relief to acute, agonizing pain. Freezing of the part is not necessary to produce the best results, and sometimes it should be avoided. In the use of the methyl chloride a few seconds' application to any one spot is generally long enough, as severe irritation, and even sloughing, may follow its use.

IODOFORM, in saturated solution in chloroform, AMYL, COLLOID, ICHTHYOL, HYDROCYANIC ACID, OLEATE OF MORPHINE, equal parts of CHLORAL and CAMPHOR, are among the many local anodynes vaunted as specifics for neuralgia. With none of this batch has the writer any experience.

SULPHUR externally sometimes gives excellent results. It should be freely sprinkled over the neuralgic region on cotton wool, and then bandaged firmly. In sciatica, the writer has had great satisfaction in many chronic cases with this remedy.

The spinal ice bag and the ice cap have been tried, but they very often greatly aggravate the paroxysm. The wet pack and other hydropathic methods may be safely tried in many cases of obstinate neuralgia.

ELECTRICITY, though only mentioned at the end of the list of remedial agents, is one of the most valuable methods which we possess for treating the various forms of neuralgia, but, like every other remedy mentioned, it often fails, and at present there is no known method by which we can venture to prophesy its success or failure until the experiment has been carried out. It is about equally valuable and equally worthless in visceral, facial, or sciatic neuralgia, and, until tried, the relative value of each form of electrical treatment cannot be determined.

As a rule, it does not practically matter about the exact position of the electrodes, though the rule is laid down that to produce the most marked sedative effects the circuit should be closed with the anode

over the affected nerve, and the kathode upon an indifferent region in the neighborhood. The continuous current is the most likely to give the best results. The electrodes should consist of large flat metallic plates covered over with several layers of warm moistened wash leather or sponge. One being placed over the trunk of the nerve, the other may be slowly moved up and down over the regions to which its branches are supplied. Ten, fifteen, or twenty Leclanché cells may be employed. No shock or painful contraction of the muscles should be produced, and the application should be continued for five or ten minutes. The writer has observed neuralgia to disappear after a few such applications, though this is a comparatively rare occurrence.

In sciatica, the current from fifteen to twenty cells may be made to traverse the lower extremity, and before lifting the electrode off the skin the various cells may be gradually cut off by using the handle of the switchboard so as to prevent a shock.

Where the continuous fails, the interrupted current may be employed. It is not advisable to use many cells, and the interruptions should be rapid. When this fails, a strong current may be used as a counter-irritant. The writer has several times found patients who have used the common electro-magnetic machine with great benefit even in sciatica.

McClure speaks highly of static electricity, and he has made the important observation that during its use the action of internal remedies appears to be much intensified. In facial neuralgia he employs the souffle by a metallic point for ten minutes, and where this fails, he draws fine sparks by approaching it nearer to the skin, and finally he extracts heavy sparks by means of the metal ball, and he finds that occipital, facial, cervical, and brachial neuralgias readily yield to this treatment.

Pressure upon the nerve trunk, and the application of a succession of smart taps or vibrations generated by means of an ingenious apparatus devised for the purpose, have been followed by results which, as a rule, can be more readily obtained by other remedies.

When a case of neuralgia has proved rebellious to the various remedial agents already enumerated, the question of surgical interference must be seriously considered. Before finally deciding it will be worth while to try massage and a change of climate, when the patient's means and the nature of his neuralgia will admit of such a step. A dry, warm atmosphere may be tried. A long sea voyage often gives excellent results, and does away with the necessity of surgical operations.

The following are the various procedures which have been successfully practised for the relief of obstinate neuralgia:

1. Nerve stretching.
2. Neurotomy, or section of the nerve.
3. Neurectomy, or excision of a portion of the nerve.
4. Nerve-avulsion, or the tearing out of a nerve trunk from the bony opening through which it passes.
5. Nerve ligature.

Nerve stretching is performed in two different ways. The first, or minor method, known also as bloodless nerve stretching, should always be tried before resorting to the cutting operation, when the anatomical position of the nerve permits. The bloodless method can be easily carried out in the case of the sciatic nerve. The patient being thoroughly brought under the influence of chloroform or ether, the hip-joint is powerfully flexed, after which the knee is forcibly extended, and then the ankle is brought into a condition of extreme flexion, and the entire limb should be maintained in this position for about fifteen minutes, when a vigorous massage may be applied for ten or fifteen minutes more. Sometimes the limb is bandaged in this position, but, as a rule, this is not advisable. The stretching may be repeated two or three times, the patient being kept quiet in bed in the intervals. The writer has seen an obstinate attack of sciatica speedily disappear in a patient who fell in such a position as to severely stretch the limb and nerve.

In the more radical method of stretching a nerve, the operation is performed, under chloroform, by cutting down upon the trunk and exposing the nerve sheath, after which the forefinger or a blunt hook is passed underneath it, and *steady traction* made for about ten minutes, as the nerve is lifted from its bed and extended both in the proximal and distal directions. The wound is treated upon ordinary surgical principles, with stict antiseptic precautions, and rest of the limb upon a splint should be enforced for ten days at least, until healing is firmly established. The ultimate result is highly satisfactory, especially when it is remembered that only the most obstinate cases are submitted to this method of treatment. According to Marshall, three out of every four cases so treated are permanently cured.

When stretching fails, a similar incision may be made in the direction of the nerve trunk, the sheath exposed, and the nerve divided after pulling it gently out of its bed.

In the more severe operation of neurectomy, undertaken after failure of the division of the nerve, a portion of the length of the nerve is completely removed.

In avulsion, after anæsthesia has been fully established, a free incision is to be made over the nerve near to its emergence from the bony canal or foramen through which it passes, and after its trunk has been fully exposed and freed from surrounding attachments as far as possible, it is seized between the blades of a stout pair of forceps, and forcibly torn out of its bony canal. Sometimes it may be even necessary to gouge out the bone surrounding the foramen in order to tear away as much of the nerve as possible lying in the canal.

Ross, after stretching the inferior dental nerve, was compelled at a subsequent period to excise half an inch of it, and upon a second return of the neuralgia he repeated the operation, at the same time excising a portion of the lingual, and upon a continuance of the neuralgia, he removed the entire Gasserian ganglion and the superior maxilla.

The method of treating neuralgia by hypnotic suggestion is men-

tioned last. The writer has had no experience whatever of its working, but from the reports of those who have been laboring specially in this rather mysterious field of therapeutics, most brilliant reports continue to flow in. After hypnotization, caused by fixing the eyes upon a bright object for a brief period, the patient is assured that all pain will disappear immediately, and upon awakening this result is, according to reports, almost always found. Even in cases where neuralgia has been caused by some organic mischief producing pressure upon the nerve trunk, the pain has been found to keep away for very long periods.

The treatment of the various forms of neuralgia—*i. e.*, of neuralgia affecting the different nerves of the body—need not be gone over in detail, as the same principles are, for the most part, applicable to all nerves. Sciatica will be again briefly referred to under its own heading.

NEURASTHENIA—See Hysteria.

NEURITIS.

The first step toward treatment is to remove the cause. Thus, if owing to syphilis or rheumatism, these diseases must be met by appropriate remedies. Iodide of potassium, or mercury, or both combined, being indicated where there is any reason to suspect syphilis, and salol, salicylates, and at a later stage iodides, if there be any evidence of rheumatic inflammation, gout, and diphtheria. Tumors or foreign bodies, or inflammatory processes leading to purulent collections pressing upon and irritating the nerve in some part of its course, call for prompt and radical treatment. Where neuritis follows exposure to the fumes or fine particles of irritant or other poisons, as mercury inhaled for long periods, or the dust of arsenical wall papers, or lead poisoning, or chronic alcoholism, removal of the cause or removal of the patient from the sphere of its influence should be determined upon. Cold and damp may be the exciting cause.

Absolute rest of the affected limb, with anodyne applications or deep injections of small doses of cocaine or morphine, and the general treatment applicable to the early stages of acute neuralgia, are indicated. Leeching is of little use; but a few small cupping glasses placed over the leech bites may be productive of relief, and may have the power of controlling the inflammatory action going on in the sheath of the nerve. Blisters may be tried. Paralysis and wasting of muscles must be met at a later stage by the constant use of a weak, continuous, and afterward of an interrupted current and massage. In the multiple variety local applications are of little use. The internal administration of large doses of iodide of potassium, with occasional resort to antipyrine for the relief of pain, is the best treatment.

Where much pain and hyperæsthesia exist, the affected parts may be swathed in absorbent cotton wool, and bandaged so as to prevent

variations of temperature. A water bed in which the fluid can be kept at an even and uniform temperature is a valuable adjunct to treatment.

NEUROMA.

Though much temporary relief may be obtained by the judicious use of pain-relieving remedies, as detailed under the local treatment of neuralgia, permanent benefit must only be expected from cutting down upon the tumor and dissecting it out. Where it is found to involve the entire thickness of the nerve trunk, this should first be well stretched before excising the diseased portion, in order that the cut ends may be brought together by sutures before closing up the wound.

Mayo Robson, after excising a considerable length of the median nerve, which was involved in a tumor to which it was adherent, transplanted a piece taken from the posterior tibial nerve, dissected out of a limb which had been amputated immediately before the neurectomy operation. The graft was retained in position by catgut sutures passed through its extremities. At the end of five weeks sensation in the parts below the operation was perfectly restored, though some atrophy of the muscles supplying the thumb remained. Notwithstanding that there is room for questioning this result as being one of genuine nerve-grafting, it clearly points to the treatment which should be adopted (when possible) after the removal of a large piece of a nerve in its entire thickness in the operation for a neuroma.

NIGHTMARE.

The treatment, if possible, should be preventive, and a close scrutiny of the causes which were at work in former attacks will generally give the clue to the management of the patient's feeding, sleeping, or mental work, which will prevent the recurrence of the disorder. As a rule, it is produced by the presence of a considerable amount of undigested or indigestible food lying in the stomach, and this is very often produced by late suppers in those who dine early. The habit of occupying the mind by severe exercise up to the moment of lying down may be the cause of the attack. Severe business worry, prolonged grief or anxiety, and alcoholic excesses may be the cause. Some patients are liable to experience attacks when they turn over upon their back to sleep, or when the weight of the body, sinking gradually into the depths of a soft feather bed, causes the head to slip off the pillow. Late dinners which do away with the necessity of supper, a hard hair mattress, and a contrivance which awakes the patient the instant that he turns over upon his back, such as the tying of an empty cotton-reel across the back (*i. e.*, over the spine), and the avoidance of indulging in severe mental labor before retiring to bed, will generally prevent the attack. A full dose of bromide of potassium or, better still, sulphonal will be worth trying when there are special reasons for suspecting an attack.

When the attack comes on, the sooner the patient gets roused thoroughly the better. There is not much use in prescribing remedies which he is to use himself, as by the time he would be in a position to employ them the attack would have entirely passed away. He should be advised to get rapidly out of bed as soon as he is able, and dash some cold water upon his face, or dip his head into a basin of water. When the attack tends to recur upon the patient's again lying down, he may induce vomiting, and insure the complete evacuation of the contents of the stomach. The friends of a patient who is subject to attacks of nightmare may be instructed to administer a whiff of nitrite of amyl, strong ammonia, or a cold douche.

NIGHT SWEATS—See under Phthisis.

NIGHT TERRORS.

The distressing attacks occurring in young children, and known as *Pavor nocturnus*, appear to closely resemble nightmare in the adult. Their cause is often obscure. Sometimes they are associated with delayed dentition, worms, and indigestion, but often appear to come on in otherwise healthy children, whose active little brains lead them into vivid dreaming. Where a cause can be determined, of course its speedy removal is the first duty of the physician, who should minutely examine into the patient's condition, especially with regard to the existence of epilepsy, and every departure from health should be remedied. The moral surroundings of children so affected should be closely studied. The ghost stories and appalling tales of the nursery, often combined with threats of boiling evil and future punishment, should be discountenanced.

[Dyspepsia should be met by a powder after each meal, containing a few grains of bicarbonate of soda and a small dose of powdered rhubarb.

Smith lays stress upon the importance of forbidding potatoes, puddings, fruit, and cake.

After correcting every probable or possible cause, the physician may think of administering drugs, with the view of preventing future attacks.

Bromides of potassium, sodium, and ammonium afford the best means of accomplishing this. One good dose, according to the age of the child, may be given at bed-time. Sulphonal or chloral may be also given. The latter drug is, however, not so suitable, as patients often dream unpleasantly under its influence. For this reason opium is also unsuitable.

If seen during the attack, little can be done save by soothing the patient's excitement and calming his fears, by assuring him of his present safety, though often this will be of little use, as there appear to be delusions and hallucinations which will not quite leave the patient until after he falls asleep again. Punishment, cold douches, or

any treatment which could possibly add to the little patient's distress is to be strongly condemned.

The following mixture may be administered at bed-time every night to a child one year old:

℞.—Ammonii bromidi } āā ℥ss.
Sodii bromidi }
Vini antimonii ℥ss.
Syr. simpl. ℥j.
Aquæ menth. pip. ad ℥ij.—M.

S.—A teaspoonful to be taken every night at bed-hour.

Money recommends a mixture like the following for excitable or nervous children. It may be given to a child seven years old:

℞.—Ammonii bromidi ℥j.
Pulv. rhei gr. xlv.
Sodii bicarb. ℥jss.
Syr. zingiberis ℥vj.
Aquæ menth. pip. ad ℥iv.—M.

S.—Take two teaspoonfuls three times a day, after meals. Shake the bottle.

NIPPLES, Sore.

Much of the miseries attending first confinements may be attributed to trouble starting in the nipple during pregnancy. This may often be prevented by early attention and absolute cleanliness, as the thick epithelial crusts should be regularly washed away, so as to cause the epithelial covering of the nipple to attain a sufficiently robust growth, otherwise it remains delicate and liable to tear, fissure, or ulcerate. Mischief is done by the application of strong astringent applications at this stage. Such measures, by hardening or partially tanning the skin, cause it to crack when traction is afterward made upon it. The most that should be done in this way is occasional sponging with weak spirit lotion. Continual moist applications produce a sodden condition, in which linear ulceration is apt to be set up. Glycerin, vaseline, or ointments are also objectionoble. When tenderness is felt in the nipples during pregnancy, they should be protected from the friction and pressure of the dress by the constant use of a proper vulcanite or soft metal nipple shield.

Depression of the nipple, in which it lies in a hollow, projecting above the surrounding skin so slightly as to render it impossible for the child to grasp it, is a common condition, and if discovered sufficiently early may to a great extent be remedied by wearing all through the later months of pregnancy a properly-fitting shield, made of soft metal. This shield should be of the form and proportions of a large nipple, with a wide base to rest upon the areola. It is known as the Wansbrough metallic shield, and is of the greatest value in this and

many other conditions. Apparently some action is set up between the skin and the metal; which becomes moistened with perspiration, and in the case of ulceration this has sometimes a very beneficial effect upon healing. For our present purpose it is only the mechanical effect of the nipple being driven slightly into the hollow cone of the shield by the pressure of the dress that is desired, so as to counteract depression. India-rubber shields are also useful. Where this plan fails, there is little use in drawing out the nipples by means of any of the innumerable suction toys designed for this purpose; they often do mischief.

Kehrer has devised a simple operation, by which the depressed nipple is raised out of the hollow, saucer-shaped depression in which it lies. He excises a ring, or two crescentic pieces of skin surrounding the nipple. As the wound heals, the approximation of its lips pulls upon the skin immediately surrounding the nipple, and causes it to project.

Trouble being anticipated owing to the faulty formation or tenderness of the nipples, extra care should be taken immediately after delivery, as fissures in this locality are the chief cause of suppuration of the mammary gland. Two extremes must be guarded against—the child should not be permitted to tug away for any length of time at the empty breasts before milk has come to them, nor should it be kept from the nipple until the gland has become so engorged with milk that emptying of it is rendered most difficult and painful.

If, notwithstanding these precautions, the nipples become tender and painful, a glass nipple shield, to which an India-rubber teat is directly fitted on, may be applied to the tender nipple. Through the teat the child may be able to empty the breast without causing much pain to the mother.

This often proves unsatisfactory, and cause even more pain than the lips of the child directly applied to the nipple, and the physician has his patience sorely taxed by trying one form of breast-exhauster, nipple shield, and suction apparatus after another. In the meantime the soreness of the nipple increases, and is found to be caused by an ulcer, fissure, crack, or abrasion which demands local treatment.

The best lotion for general use is the following. The writer finds it much more likely to be successful in causing rapid healing than any other:

℞.—Alcoholis purif. ℥j.
Aquæ rosæ ℥iij.—M.

S.—To be used as directed.

This should be sponged freely over the nipple and areola after each occasion when the child attempts to drink, and a small circular piece of lint soaked in it should be laid upon the excoriated surface, and covered carefully over with a larger piece of oiled silk.

Some authorities recommend that the fissure or ulcer should be touched with a finely-pointed pencil of nitrate of silver. This is often a very painful practice, and the writer thinks that he has seen it determine suppuration. He has obtained more satisfactory results by touching the dried surface of the excoriation with strong liquefied carbolic acid before applying the above lotion. Carbolic lotion (1 : 30) makes an excellent application, and sometimes eases the pain of the fissure by acting as a local anæsthetic, though the writer believes that healing is more rapid under the spirit and rose water.

Nearly every known form of astringent application has been recommended and used for the healing of sore nipples, and each nurse and physician believes in some one formula. As a rule, it may be said that all ointments and greasy applications are found by experience to be much less satisfactory than lotions.

Astringents are open to the objection that by hardening the tissues they sometimes appear to increase the tendency to cracking and fissuring. The best pure astringent application is an infusion of green tea. If used at the proper time it often gives excellent results.

Glycerin of tannin (1 : 4) is a convenient and valuable remedy, and is not open to the imputation of markedly increasing the tendency to crack or fissure.

Tannin may also be applied in watery or spirituous solutions.

Catechu, rhatany, kino, and other vegetable astringents have been used.

Various iron and lead salts are also much praised.

Substances in the form of fine powder may be used with advantage in the early stages, and when there is any tendency to eczema, they are very soothing. In this way, with a puff, zinc oxide, Fuller's earth, powdered starch, etc., may be applied. Glycerin of starch has similar action. Lime-water, balsams of Peru and tolu, chlorate of potash, Friar's balsam, collodion, weak sublimate solutions, and many other plans may be mentioned.

The glycerin of borax (1 : 5) must not be omitted. The writer has often treated cases all through the different stages with this remedy alone with much satisfaction. Where for any reason the spirit and rose water lotion should not be used, this is the application which he would select for routine treatment.

During the healing of the excoriations the best must be done to give the nipple rest by the use of pumps and shields, one after another of which should be tried until the least painful method of emptying the breast is arrived at. In very severe case suckling must be suspended for a time, or even permanently, and in any case the supply of milk should be diminished, if abundant, by the judicious use of purgatives and alterations in the diet of the patient. The child's mouth should be kept healthy by constant cleanliness, and the occasional application of the glycerin of borax to the tongue and lips. (See also under Mammary Gland, Inflammation of, page 482.)

NIPPLE, Malignant Disease of,

Can only be met by removal of the gland in young or middle-aged subjects. In aged patients the nipple may be removed with the surrounding tissue, but this is not an operation likely to be followed by satisfactory results. The writer has under observation a typical case of carcinoma, following eczema of the nipple (Sir James Paget's nipple), and the progress is so very slow, extending over many years, that operative interference does not appear to be warranted.

Eczema of the nipple occurs as in other regions, and proves often susceptible to ordinary treatment, such as astringent lotions, the best of which would be strong solution of subacetate of lead 1, liquor carbonis deterg. 1, water 20. Ointments are more convenient, the most useful combination being zinc ointment 7, liquor carbonis deterg. 1, ammoniated mercury ½. Powders, such as oxide of zinc, Fuller's earth, or starch powder may be used with advantage. (See Eczema.)

Of a different nature, however, is the inveterate chronic eczema first described by Paget, which, confining itself for many months or even years to the nipple and areola, gradually and almost imperceptibly passes into a truly malignant form of disease, invading the deeper portions of the gland. For the latter condition, as already mentioned, there is no remedy but removal of the entire breast, and even this is far from being followed generally by satisfactory results. For the preliminary eczematous stage, little can be done. Most authorities regard it as beyond the reach of medicine. Certainly, irritating or stimulating applications should be forbidden, as by such means there is reason to believe the ultimate development of carcinoma may be hastened. The nipple should be carefully shielded from friction and the irritation liable to be produced by the pressure of dress. A vulcanite or rubber shield answers this purpose well. Of local applications the best will be simple vaseline, or a very weak spirit lotion, containing 1 grain of corrosive sublimate to every 4 ounces. The writer would advise the alternate use of these applications for about one month at a time.

NOCTURNAL EMISSIONS—See under Spermatorrhœa, Hypochondriasis, and Masturbation.

NODES—See under Syphilis.

NOSE, Affections of—See Ozæna, Polypi, etc.

NYMPHOMANIA.

The treatment of this affection when fully established can only be carried out satisfactorily in institutions which possess all the machinery necessary for the management of cases of insanity. Seldom in private practice can the serious responsibility of undertaking the moral,

hygienic, and medicinal treatment of such cases be safely risked by the physician. As the nature of the affection is one which tempts the relative of the patient to shun the exposure which they feel that removal to an asylum entails, the physician is often compelled to take charge of such cases for a time.

It is needless to dwell upon the question of moral treatment. This must be left in the hands of discreet and trusted female relatives or nurses. One thorough examination of the sexual organs should be made where there are reasons for suspecting local mischief. Frequent vaginal examinations must be strongly condemned, but as there may be possibly some serious local complaint, it is advisable to have this set right when practicable. Ovarian neuralgia or inflammation, endometritis, congestion or chronic irritation of the external genital organs, may be the exciting cause of the mania. When such lesions are detected, and when from a serious consideration of the history and present condition of the patient, there appears to be a legitimate prospect of improvement after the local mischief has been removed, local treatment may have a fair trial.

Drugs alone are of little value, but as adjuncts to moral and hygienic management, bromides, camphor, and other anaphrodisiacs may be administered in full doses. Enemata of tobacco have been recommended, but in doses short of danger they are useless, and hence cannot be judiciously employed at all.

OBESITY.

Many volumes have been written upon the treatment of this not uncommon condition, and a considerable number of "systems" or plans have been elaborated, some of which are based upon false physiology. It cannot be too strongly stated that too many deaths are indirectly owing to unwise attempts to rigidly carry out the details of these systems. The success of such attempts too often means that the patient is left in a much worse condition in other respects, though his weight may have been considerably reduced.

As a rule, it may be said that the treatment of obesity by the administration of drugs should be left out of the question. Occasionally drugs may be used as adjuncts to other measures, but if used at all they must play a very subordinate part. If administered in such quantities as will ensure a marked reduction of body weight without the aid of radical changes in dietary, serious danger to life may result. The medicinal substances recommended for the treatment of obesity are—vinegar, alkalies, chloride of sodium, bromides of sodium and ammonium, salts of potassium as the permanganate and iodide, liquor potassæ, vegetable acids alone or in combination with potassium or sodium, fucus vesiculosus.

All of these, except perhaps fucus vesiculosus, are productive of serious mischief when given in doses sufficient to diminish the amount

of fatty tissue, owing to their deleterious action upon the composition of the blood, when administered for long periods. Vinegar is often found to be the cause of serious mischief in vain females who imbibe it in large quantities with the intention of reducing their florid complexions and comely rotundities.

Fucus vesiculosus, which is the basis of a popular remedy for obesity, is the ordinary bladder sea-weed or wrack. The writer has never had an opportunity of studying its action, but he knows that in some parts of the North of Ireland pigs have been fattened for market upon it, and it is therefore extremely improbable that in the ordinary doses recommended it can appreciably diminish the amount of fatty tissue in man, especially when we consider the close affinities existing between the two, both structural, as observed in the dentition, and physiological, as seen in the omnivorous character of the food.

Exercise is a powerful factor in the prevention of obesity, though not so reliable as a method for reducing it when once firmly established. No system of treatment will, however, be complete which does not recognize it as an important element, and little need be said here about it, since it will be referred to more fully in detailing Oertel's method. Exercise will, however, be of little avail in any case unless it be carried out in the open air. The writer believes that exercise systematically performed in the water or open sea, as in strong swimming, is a powerful means of safely reducing the body weight, and he has long recommended it when circumstances permitted obese patients to avail themselves of its benefits.

The Turkish bath and the breathing of compressed air, with the view of increasing tissue waste, have not been followed by satisfactory results, within safe limits.

From the above remarks it will be seen that the only satisfactory way in which obesity can be treated is by some dietetic system, of which there are many. Professor Yeo, in his invaluable work on *Food in Health and Disease*, has pointed out that almost all of these systems or dietetic methods aim at reducing the body weight by reducing the total quantity of the food consumed. The mistake made by those who devised the older plans of treatment was in considering that fat was only formed out of certain classes of food, while we now know that fat can be manufactured in the living laboratory out of—(1) nitrogenous bodies (albuminates), (2) hydrocarbons (fats), as well as from (3) carbohydrates (starch, sugar, etc.). The essence of the matter consists in the fact that some individuals manufacture and store up their fat chiefly from some one of these classes of food, while others may chiefly store up their fat from another class, and hence no one system can be expected to suit all the cases of obesity. By a careful study of each case the physician can soon find out which plan is best suited to it. Often the most suitable treatment will not lie in hard and fast adherence to any recognized plan, but in such modifications of it as may be rationally decided upon after frequently weigh-

ing the patient and watching which class of food best nourishes the body and maintains a high state of vigor without adding to the deposition of adipose tissue. Unless there are special reasons for the contrary, it will be desirable to make the changes slowly and gradually at first. Sudden and marked reductions in the body weight cannot be safely made, and, moreover, the attempt often leads to the disarrangement of both appetite and digestion.

The Banting method, originally prescribed by W. Harvey for Mr. Banting, is one of the oldest and best known plans for combating obesity. The following is a sketch of the dietary, which has been from time to time considerably modified to suit individual peculiarities:

Breakfast (at 9 A.M.): 5 to 6 ounces of animal food, consisting of beef, mutton, kidney, bacon, boiled fish, or hot or cold meat of any kind, except veal and pork. A little biscuit, or 1 ounce dry toast. A large cup of tea or coffee, without sugar and milk.

This consists in all between solids and liquids of about 1 pound avoirdupois.

Dinner (at 2 P.M.): 5 to 6 ounces of any fish, except salmon, eels, or herrings, or 5 to 6 ounces of any meat, except pork or veal, or 5 to 6 ounces of any poultry or game. Any vegetables, except potatoes, parsnips, carrots, beet-root or turnips. One ounce dry toast. Cooked fruit out of a pudding and unsweetened. Ten ounces claret, sherry, or Madeira; champagne, port, or beer, being forbidden.

This consists in all between solids and liquids of about $1\frac{1}{4}$ pounds. (In the original pamphlet there is some ambiguity about the poultry and game.)

Tea (6 P.M.): 2 to 3 ounces cooked fruit and a rusk or two, and 9 ounces tea without milk or sugar.

Supper (9 P.M.): 3 to 4 ounces of fish or meat, as at dinner, with 7 ounces claret, or sherry and water.

It will be seen that starch and sugar are forbidden, and that the diet for the twenty-four hours consists of less than 1 pound—*i. e.*, 13 to 16 ounces—of animal food with 2 ounces bread, and less than $\frac{1}{2}$ pound other solids, chiefly fresh vegetables and fruits, and about 2 pounds of fluids.

This system is seldom employed now; it is not capable of maintaining life for any considerable period without inducing dyspepsia and gout, and, it is stated, also renal disease. There is often loathing amounting to extreme or unconquerable abhorrence of animal food induced, and the patient complains of chilliness and weakness, and feels compelled to break through or throw up the system, with the feeling that life is not worth living under its restrictions. This plan, as modified by Vogel, is still occasionally employed. He permits boiled eggs, raw ham, thin bouillon, and some potatoes.

Ebstein's system of reducing obesity is based upon a very different principle. He recognizes that Voit's conclusions are correct, and that fat is formed by albuminous foods, especially if carbohydrates are freely

administered at the same time, and that this transformation takes place independent of the administration of fats. He insists that the presence of fats in the food tends to prevents its deposition in the body, and hence fatty substances, such as butter, very fat meats, and rich gravies enter into his method. These prevented the longing for hydrocarbons and produced a sense of satiation, and this is the chief feature in his plan of treatment.

The following is a sketch of his dietary:

Breakfast (6 to 7.30 A.M.): 50 grammes (1.76 ounces) white bread (toasted) with plenty of butter, and 250 grammes (8.8 ounces), tea without sugar or milk,

Dinner or luncheon (2 P.M.): Fatty soup made from a beef-marrow bone; 120 to 180 grammes (4.25 to 5.6 ounces) fat meat with some cabbage, asparagus, spinach, peas or beans in moderate quantity, and 2 or 3 glasses of light wine, and a little stewed fruit without sugar.

Late in the afternoon: A cup of tea without milk or sugar.

Supper (7.30 P.M.): A large cup of tea without sugar or milk; 30 grammes (nearly 1 ounce) each of bread and butter, one egg, or a corresponding bulk of fat ham, fat roast meat or cheese, with fresh fruit. No alcohol.

This spare diet has given moderately successful results. The amount of fat helps to reconcile the patient, where Banting's method could not be tolerated. The hydrocarbons are in too small amount to sustain life.

In contrasting these two systems, the following figures from Professor Wood are of much service:

Average food of a healthy man: Albuminous materials, 30 drachms; fat, 25 drachms; starchy hydrocarbons, 92 drachms.

Banting's dietary: Albuminous materials, 43 drachms, fat, 2 drachms; starchy hydrocarbons, 5.25 drachms.

Ebstein's dietary: Albuminous materials, 25.5 drachms; fat, 21.25 drachms starchy hydrocarbons, 11.75 drachms.

If to these we add an estimate of the next method to be discussed—*i. e.*, Oertel's—their relative values may be seen at a glance.

Oertel's dietary: Albuminous materials, 45 drachms; fat, 9 drachms; carbohydrates, 25 drachms.

Oertel's system of treating obesity, improperly called also Schweninger's, has already been detailed briefly when discussing the treatment of valvular lesions. Though introduced, in the first instance, to correct a condition of excessive corpulence, combined with great shortness of breath from fatty degeneration of the heart, it has been extended to the treatment of simple obesity and of valvular lesions.

It differs, as will be seen from the above figures, from the Banting system by permitting more fat and hydrocarbons, and from Ebstein's by nearly doubling the albuminates and carbohydrates, and halving the fat.

The chief feature in the method is the abstraction of water from the body. This is effected in reducing the supply to a minimum and increasing greatly its secretion and elimination by vigorous exercise, producing profuse sweating, and alse by the use of dry heat, as in the Turkish or hot air-bath.

Upon page 343 will be found a diet table giving the particular composition of the different articles and the amounts in English weights and measures. This is the diet table generally selected in the treatment of obesity associated with heart complications. It is, however, suitable in the management of simple obesity without any alteration worth mentioning, save that the roast meat in the last meal of the day may be omitted. The details of the climbing and other exercises have been before referred to. In simple obesity without cardiac complications the amount of fluids may be gradually increased, and one or two glasses taken at the noon meal, and the amount of water increased from 2 to 10 ounces at the evening meal.

Schweninger's modification of Oertel's method consists in the absence of any beverage at meals, all the fluid permitted being swallowed after the lapse of two hours after each meal.

Germain Sée adopts Ebstein's method, only insisting upon copious imbibition of water or hot weak tea or coffee and abstinence from alcohol.

Weir Mitchell recommends the simple plan of feeding upon skimmed milk, with several ingenious restrictions. Thus he insists upon absolute rest in bed or upon a couch, and by careful weighings he determines the exact amount of milk necessary to sustain the body-weight, after which such a reduction is gradually made as will cause a loss of eight ounces in weight each day, or in weak patients four ounces daily; massage twice daily, and latter on, exercise by means of the Swedish movements. Where appetite or digestion shows signs of rebelling against the milk, beef-tea, chicken or oyster soups, to relieve the monotony, may be permitted. When the requisite diminution in weight has been achieved active Swedish movements are still maintained, and the milk diet to a large extent kept up, and a rational diet selected to prevent increase in weight. This diet should include albuminates, fish, beef, mutton, and oysters, with but a moderate amount of hydrocarbons; ordinary exercise, and return to business may then be allowed.

The Salisbury method, which consists in using a diet consisting of beef steaks and hot water, has been modified by Towers-Smith, so as to free it from some of the serious objections to which it formerly was open.

The following is a sketch of his plan: He gives for the first fourteen days for breakfast and luncheon, one pound of lean rump steak; for dinner, one pound of grilled cod and one pound of lean rump steak; and at intervals during the twenty-four hours, one gallon of hot water, and the last thing at night, half a wineglassful of whiskey in cold water.

During the next twenty-one days the diet is more varied, and the hot

water is reduced to four pints. Mutton chops without fat, turbot, whiting, sole, green vegetables, and rusks are allowed.

During the next thirty-one days the amount of hot water is further reduced to one quart, and tea is permitted with captain's biscuit, the bottom crust of a stale loaf, fish, fowl, game, joints of any kind, with a little light wine and Seltzer water; 5 grains of bicarbonate of potassium are to be taken night and morning. After these periods, which amount to about nine weeks, the ordinary diet is indulged in.

The period is so short that there is not time for the loathing of animal food to become established. If it does threaten, the beef may be prepared as beef-tea or essence. The writer would still strongly object to this method, even for so short a period as nine or ten weeks, unless some fresh vegetables were allowed. He has seen such deplorable results where the plan was adopted, without the use of vegetables, for the cure of dyspepsia, that he believes it to be unwise to permit even this short period to be passed without fresh fruit and vegetables; and as far as he can see there is no reason why green vegetables should be withheld in the treatment of simple obesity.

This objection can be met in another way—*i. e.*, by infusing a slice or two of a fresh lemon in each cupful of hot water. In this way no serious deterioration of the blood can take place, and the objectionable taste of the hot water is entirely removed. The large quantities of hot water consumed in this system are of great value in flushing out all the effete products, and without this element the eating of three or four pounds of lean meat daily might prove a serious risk to the integrity of the kidney.

Schroth's cure for obesity is founded upon the opposite principle to the Towers-Smith or Salisbury method, as he excludes, as far as possible, water or fluid in every form, hence this plan is often spoken of as the "Dry Cure." Dancel's method is almost identical with Schroth's. The diet consists chiefly of dry rolls, two or three days old, a little thick gruel, and a small amount of light wine. It is a method to which even the most resolute patients will not long submit. Moreover, where there is any gouty tendency along with the obesity, the dry cures, such as that just mentioned, and that of Schweninger's already described as a modification of Oertel's, are dangerous as routine remedies for obesity.

Wood quotes the following dietary from an anonymous English military writer, who reduced his weight 117 pounds (more than one hundred weight in ten months by it:

"6 A.M. One pint of black coffee and one ounce of coarse brown bread or biscuit.

"9 A.M. Four ounces of lean meat, three ounces of brown bread or biscuit, and half a pint of coffee.

"2 P.M. Six ounces of lean meat, three ounces of brown bread or biscuit, six ounces of green vegetables, and half a pint of any fluid

except ale, effervescing wines, or aërated water, followed by half a pint of coffee.

"6 P.M. Half a pint of coffee.

"9 p.m.—Two ounces of brown bread or biscuit and a couple of glasses of sherry or claret.

"Fruit *ad libitum* and liquorice powder *pro re nata*."

The different spare dietaries adopted at the various spas, such as Carlsbad, Kissingen, Ems, or Marienbad, are often very successful in mild cases.

Yeo's method may be given in his own words: "The two principal objects of all these methods are, first, to make the corpulent person consume the excess of fat deposited in his body, by restricting the food-supply or augmenting its combustion by increased physical exercise or other means; and, secondly, to establish a dietary which shall prevent its reaccumulation."

None of the methods described are appropriate to the treatment of all cases of obesity indiscriminately, while any one of them may prove successful in suitable instances.

In conclusion, the following is the method which we recommend to be generally adopted: A very careful examination should be made of each case, in order to ascertain the presence or absence of any organic disease, especially of any cardiac degeneration, and if we are satisfied that the obesity is not secondary to any other morbid state, or associated with any general degeneration of organs, we may proceed with confidence to prescribe an appropriate *régime*.

The albuminates in the form of animal food should be strictly limited. Farinaceous and all starchy foods should be reduced to a minimum. Sugar should be entirely prohibited. A moderate amount of fats, for the reasons given by Ebstein, should be allowed.

Only a small quantity of fluid should be permitted, but enough should be allowed to aid in the solution and digestion of the food.

Hot water or warm aromatic beverages may be taken freely between meals, or at the end of the digestive process, especially in gouty cases, on account of their eliminative action.

No beer, porter, or sweet wines of any kind are to be taken, and no spirits, except in very small quantity. It should be generally recognized that the use of alcohol is one of the most common provocatives of obesity.

A little hock, still Moselle, or light claret with some alkaline table-water, is all that should be allowed. The beneficial effect of such a diet will be aided by abundant exercise on foot and by the free use of saline purgatives, so that we may insure a complete daily unloading of the intestinal canal.

Of animal foods all kinds of lean meat may be taken—poultry, game, fish (eels, salmon, mackerel are best avoided), eggs.

Meat should not be taken more than once a day, and not more than

6 ounces of cooked meat at a time. Two lightly-boiled or poached eggs may be taken at one or other meal, or a little grilled fish.

Bread should be toasted in thin slices and completely—not browned on the surface merely. Hard captain's biscuits may also be taken.

Soups should be avoided, except a few tablespoonfuls of clear soup.

Milk should be avoided, unless skimmed and taken as the chief article of diet. All milk and farinaceous puddings and pastry of all kinds are forbidden.

Fresh vegetables and fruits are forbidden.

It is important to bear in mind that the actual quantity of food permitted must have a due relation to the physical development of the individual, and that what would be adequate in one case might be altogether inadequate in the case of another person of larger physique."

The writer has quoted these observations at length because they exactly embody his own views, and are opposed to the very questionable practice of accepting some one of the so-called "cures" and adhering to it in every case with slavish accuracy, often to the danger of the patient's life or health. The above plan can be fully carried out without preventing the patient attending to his business, it tends to produce no unhealthy craving, and it may be safely persisted in for long periods — three essential conditions insisted upon by Ebstein. Yeo makes the mistake of forbidding fresh vegetables.

ŒDEMA—See under Bright's Disease, Heart Disease, etc.

ŒSOPHAGUS, Foreign Bodies in.

Fish-bones and pins are perhaps the most frequently found impacted substances; artificial teeth, coins, and morsels of bolted food are not rare.

For small objects, as pins and fish-bones, the expanding horse-hair probang should be gently coaxed past the foreign body for several inches, when, by expanding the hair portion and keeping it open as it is being withdrawn, the bone or pin will be brought up by gentle manipulation. In the same way coins may be extracted by the money probang or coin catcher. In the absence of a suitable probang, a skein of thread attached to the end of a flexible bougie, as recommended by Davies Colley, makes a suitable substitute, in which the body may be entangled as it is withdrawn.

Crégny advises in such cases that a skein of thread rolled up in a globular form, to which a piece of stout ligature silk is attached, should be swallowed in jam or butter, and after the foreign body has been passed the thread may be pulled up by dragging upon the silk. As it is withdrawn the foreign body may be found entangled in its meshes. Swallowing a large bolus of bread may carry small fish-bones and bristles before it into the stomach. Where the foreign body is soft it may be gently pushed down by the point of the probang or by the tube of the stomach-pump until it enters the stomach. Where angular

hard bodies are impacted this is generally a dangerous practice, and a pair of long curved forceps should be employed. If high up in the œsophagus they may be seized by the surgeon's fingers.

Occasionally the act of vomiting may be made to dislodge impactions. This may be induced by tickling the fauces or by giving apomorphine ($\frac{1}{10}$ grain) hypodermically. It is not, however, a safe practice when the body is of sufficient dimensions to completely block up the tube, as a rupture below it might possibly take place.

A smart slap with the palm of the hand, applied between the shoulders, is a popular, safe, and sometimes successful procedure when the body is lodged high up.

When a hard angular body is pushed down into the stomach in the efforts used for its removal, purgatives should not be administered, but firm pultaceous food or dry biscuits may be given with the view of enveloping the object and shielding the intestinal and gastric walls from its angularities. A diet of hard boiled eggs is, in the writer's opinion, the best means of carrying out this object.

Where a large or angular body is impacted in the upper part of the tube, laryngotomy or even tracheotomy may be necessary to prevent suffocation in the presence of severe dys nœa, and even artificial respiration may be necessary until the body is extracted. Such cases are however, fortunately rare.

Where angular and unyielding bodies, like false teeth and their accompanying fixings become firmly impacted, there is nothing left for the surgeon but to perform œsophagotomy by opening the tube through a skin incision four inches long made along the anterior border of the left sterno-mastoid muscle. The tube is reached by retracting the carotid sheath, sterno-mastoid and omohyoid muscles outward and the trachea inward. It is opened over a pair of long curved forceps introduced through the mouth and made to bulge into the wound through the opening. The foreign body is to be extracted with great gentleness and the wound in the tube closed with catgut sutures. The skin wound and the after-treatment are to be carried out upon ordinary surgical principles.

Cases are recorded in which after artificial teeth with their hooked plates had been swallowed and passed into the stomach, where they have given rise to severe pains and obstinate vomiting, they have been successfully extracted after having been fished up with a money probang or coin catcher introduced through the mouth.

ŒSOPHAGUS, Stricture of.

Practically these are found to be simple—the result of corrosive poisons—or malignant.

The treatment of simple stricture is for the most part embraced in the word dilatation. When a bougie can be passed, it should be kept in as long as the patient can tolerate it, after which a larger one may

be tried, and so on until the canal is fully dilated. After corrosive poisoning, of course the passage of instruments is unjustifiable until considerable healing of the ulcerated spots has taken place, but it is a mistake to delay the introduction of a bougie too long. In severe cases stricture is almost certain to occur, and if left to itself the canal or tube may become entirely stenosed at some point or points in its course, hence the necessity of watching such cases and insisting upon the passage of the largest possible bougie from time to time, as long as any narrowing is found to remain. The writer objects to the ordinary olive-shaped bougie, mounted upon the whale-bone stem. He believes a well-made gum-elastic solid instrument is a safer dilating force, and he has had these made with a considerable taper at the point.

The graduation in size may in the smaller ones reach from about the calibre of a No. 4 English catheter at the point to a No. 8 or 9 a few inches upward. For long strictures these answer very well. In the *Dublin Journal*, August, 1879, he reported a case which he exhibited before the Ulster Medical Society, in which the smallest catheter at one time could not be made to pass. Nearly every form of dilator was tried, and finally, he used a bougie made of partially dried and fresh sea tangle with success. This substance was soft enough to work its way through the narrow ulcerated opening without causing pain, and yet possessed sufficient firmness to become the medium of conveying a safe amount of force. In addition to these qualities, there was, of course, the valuable property of its trifling increase in size, as it lay in the narrow stricture. After a time, large graduated gum-elastic bougies were introduced, and the patient made an excellent recovery.

Where a gum-elastic tube can be passed through the stricture, it may be left *in situ* for several days with the greatest advantage.

Internal œsophagotomy is a dangerous operation, and with skilful use of graduated bougies, it is uncalled for.

The stomach has been opened by Loreta, and through it a metallic dilator has been successfully employed to dilate a stricture situated near to the cardiac end of the œsophagus, after which the gastric incision has been sutured, and the stomach returned to the abdominal cavity and the skin wound closed up.

Where the passage of even the smallest bougie it found to be impossible, gastrostomy or œsophagostomy will be the only resort left to the surgeon.

The treatment of malignant stricture of the œsophagus is unfortunately much less satisfactory, at best it can only hope to be palliative.

There is considerable difference of opinion regarding the advisability of dilating a malignant stricture. The writer has satisfied himself that by the judicious and gentle passage of a solid graduated gum-elastic instrument he has been able to prolong life and relieve suffering, the bougie need not be passed more frequently than every fourth or fifth day at first. The fear of perforation should always be prominently before the surgeon's mind, and force is not justifiable.

When the passage of liquids becomes difficult there is nothing, as a rule, to be gained by the frequent introduction of the bougie. Two courses are then open, either to introduce a soft rubber tube through the mouth or nose into the stomach for feeding purposes, and allow it to remain as long as the patient can tolerate its presence, or else to adopt Symond's ingenious plan. He inserts into the stricture upon the end of a suitable bougie passed through the mouth a short gum-elastic tube, with the upper end dilated into a flattened funnel. This upper end rests in the dilated part of the œsophagus immediately about the stricture, while the tube occupies the stricture, and extends below it. A piece of stout silk is attached to the funnel-shaped part, and is brought out through some gap in the teeth, and fastened to the ear, or in any safe or convenient way. The tube may be left *in situ* for days. Through it liquid food passes easily down to the stomach, and often after a time a larger and shorter tube may be inserted when dilatation has resulted from its pressure.

When, through frequent spasmodic cough, the tube can be no longer kept in its place, and the stricture gradually closes, and in those cases where, owing to the narrowness of the stricture, tubage is from the first time that the patient has come under notice impossible, gastrostomy or œsophagostomy is the only means by which the surgeon can hope to prolong life, or minimize the terrible sufferings attending slow death from starvation.

Rectal feeding should be tried in all cases, even where the patient is still able to swallow liquids. (See also under Cancer, page 102.)

ONYCHIA.

The old-fashioned treatment is still employed by some surgeons. It consisted in the local application of Abernethy's lotion, which consists of 2 drachms of liquor potassæ arsenitis, and 1 ounce of distilled water. This was applied upon lint, which was frequently moistened by fresh quantities of the arsenical solution. This method sometimes increases the pain and tension of the inflamed tissues. A better application is the carbolic or spirit lotion.

Carbolic acid (1 drachm) and water (4 ounces) make a soothing antiseptic lotion, which, being poured upon lint, may be wrapped around the last joint of the finger, and enveloped in oiled silk, which should be firmly tied at its distal end, so as to form a perfectly impervious finger-stall. The anæsthetic influence of the acid is most grateful, and after a time the ulcerated surface ceases to occasion pain, and healing is induced. Chloral (5 or 10 grains to 1 ounce of water) may be also used. Iodoform may be dusted over the part, or a mixture of iodoform and prepared calamine in equal quantities may be employed.

Finely powdered nitrate of lead is an excellent remedy, and the writer has used it successfully in the troublesome onychia attacking

the toes of the young girls employed in the moistened atmosphere of flax-spinning rooms.

Where an ointment is more convenient, the boric acid, tar, mercurial, or red precipitate salve may be used.

Sometimes a free application of a strong solution of nitrate of silver at the beginning of the affection leads to a speedy improvement.

Where exuberant granulations spring up, strong carbolic acid, or the liquor ferri chlor. fort., or the liquor ferri sulph. may be brushed over them, or tannin or alum may be dusted over the part, or it may be daily rubbed with a large crystal of sulphate of copper.

Where these measures fail, the nail should be removed, and the raw matrix dressed with the powdered nitrate of lead.

In very obstinate cases, where the onychia returns with the growth of the new nail, the best procedure is to shave clean off with a sharp large scapel the dorsal surface of the last phalanx, removing both nail and soft parts, or to remove the nail and destroy the matrix with strong carbolic or nitric acid, or with the strong solution of nitrate of mercury.

Syphilitic onychia is best treated by the application of a weak corrosive sublimate lotion, yellow or black wash, or by freely dusting over the part with calomel, or by applying calomel ointment spread upon lint.

In such cases internal antisyphilitic medicines are absolutely necessary, and in strumous subjects constitutional treatment is equally necessary. (See Scrofula.)

OPHTHALMIA—See Conjunctivitis.

OPIUM HABIT.

For the treatment of acute poisoning by opium or morphine, see under the heading Poisoning. The management of cases is very difficult where, from the prolonged indulgence in opium or morphine, generally commenced, in the first instance, for the relief of pain, the patient becomes so enslaved to its use that a confirmed habit becomes established.

The habit may remain long after the cause for which the narcotic was first prescribed has passed away. Not uncommonly the administration of morphine by the hypodermic syringe is the form in which the vice is indulged.

In whatever way the narcotic has been used, when an effort comes to be made by the patient to break through the chain which has enslaved him, the physician will have to decide the serious question of whether the habit should be broken off suddenly or gradually.

The former plan is the best in those cases where the habit has not been long established. It affords in all cases the best prospects of success when it can be carried out, though the sufferings of the

patient are most terrible for a time, and liable to be followed by collapse.

When such a course is decided upon, the patient should be under the eye of a physician all the time, and a thoroughly reliable and firm nurse is an essential part of the treatment.

The great difficulty in this plan of suddenly stopping the narcotic is the effect upon sleep, and provision must be made for this from the first. Under Insomnia, the reader will see all the various substances, any one of which he may try which does not contain opium or morphine. The writer has tried almost all of them in the condition under notice, and he finds that either paraldehyde or sulphonal is the best. It is a good plan to abstain from chloral and Indian hemp, as there is much danger of a habit being established by the use of these drugs, and the use of sulphonal and paraldehyde upon alternate nights is free from any objections.

Various drugs have been recommended as substitutes for the opium during the daytime, but speaking generally, there is little advantage in replacing one vice by another. The exception, which may be made in the case of alcohol, will be presently referred to.

Coca may be freely given, and the fluid extract of erythroxylon coca is a favorite remedy all through the depression period. The danger of the cocaine habit must not be forgotten though it requires a longer period for its establishment than the time necessary to wean the patient suddenly from his opium or morphine vice. Teaspoonful doses of the fluid extract may be commenced, and upon the second day, when the symptoms are at their worst, the dose may be given every hour. Obersteiner gives cocaine under these circumstances in solution by the mouth, and the daily amount during the first two or three days is about 8 grains, administered frequently in small quantities. After about the sixth day the drug should be stopped entirely.

Other agents, such as quinine, antipyrine, red cinchona, strychnine, etc., have been recommended, but beyond relieving some passing symptoms they are of little use. Diarrhœa, sickness, nausea, and other distressing signs are certain to aggravate the sleeplessness, and must be met by appropriate remedies.

The following mixture may be given every hour or every two hours:

℞.—Ext. cinchonæ fld. ℥j.
Ext. erythrox. fld. ℥ij.
Tinct. cinchonæ ℥ij.
Spt. ammon. aromat. ℥ij.
Glycerini purif. ℥j.—M.

S.—One teaspoonful to be taken every second hour in a wineglassful of water.

The diet should be carefully seen to. In the shock and depression caused by the sudden withdrawal of the drug, there is urgent neces-

sity to get in all the nourishing food possible. Strong beef essences and concentrated soups, with peptonized milk and other liquid foods, should be given at the shortest possible intervals, and a stock of these should be laid in before beginning treatment. The question of stimulants will crop up early, and where there are some reasons against alcohol, sal volatile may be freely given in small quantities, and well diluted.

The depression is so terrible that the unfortunate victim, who has always got little foretastes of it during the temporary withdrawal of his drug upon previous occasions, refuses to submit to treatment unless some plan is made clear to him that his sufferings shall be minimized.

The physician will often be tempted to yield to his solicitations, and give some opium during the period of terrible depression, and in many cases the treatment breaks down utterly, owing to the alarming condition of the patient upon the second day or third morning, when it would appear, that to continue the withholding of the drug would mean the cost of the patient's life or reason.

The writer has devised a means which meets the difficulty, and which he has carried out satisfactorily in one case. It consists in putting the patient under the influence of alcohol, which should be administered in such doses as will markedly influence the cerebrum, and keep the patient in a state of mild intoxication. The treatment may be commenced six or eight hours after stopping the opium, and it may be continued for four or five days, and may be gradually or suddenly stopped, as the symptoms indicate.

In some instances three days may be found sufficient. The writer is aware that such a practice is open to serious objections, the chief of which is the danger of replacing a serious vice by a worse one. It may be said, however, that three, four, or five days' alcoholic excess is not likely to lead to the establishment of the alcohol habit; nor is there any serious danger of delirium tremens following.

This treatment should only be attempted when the medical man can give the closest possible supervision to the case, and the patient must be carefully watched by a skilful nurse all through. It would appear to be most applicable to those apparently hopeless cases where the patient is anxious to try and rid himself of his enemy, where he has sufficient remnant of will left, and where all other means have been tried and failed.

The physician must always remember, however, in dealing with patients who have become the victims of any crave or habit that there is always a certain degree of moral perversion present, and that in some cases the vice may really be a symptom or result of some strain of insanity. In this latter case it is unjustifiable to adopt the alcoholic treatment unless the patient can always be kept under proper restraint. As a rule, in such cases, even though one vice is removed, the patient will, with his perverted moral sense, select another; and such cases are often found to be the victims of both

opiates and alcoholic stimulants. If the physician should succeed in weaning them off their opium, he will probably find it will be only to receive the credit of having made them intemperate.

Where the gradual plan of treating the patient by steadily diminishing the dose of opium or morphine is tried, the diminution must be made by fractional increments. Failure generally results in chronic cases by the physician's haste or anxiety to make progress, and sometimes the patient is also to blame, being tempted to curtail to an extent beyond his power of endurance. Moral treatment, in such instances, is of the greatest value for a time, and every change in the patient's environment may be a benefit, such as the selection of new companions, and occupation and change of scene and habits. Coca is here of decided value, and it may with advantage be given in combination with small doses of antipyrine. Alcohol is especially dangerous, and on no account should chloral be prescribed. The greatest difficulty will be from insomnia, and sulphonal, combined with a diminished dose of the opiate at bed-time, is the best remedy. As sulphonal is slow in acting, the writer has, in one bad case, obtained very satisfactory results in prescribing a dose of 45 grains, thirty or forty-five minutes before retiring to rest, and then giving a small opiate just as the patient lies down. This prevents the critical period of unrest at the beginning of the night, which often is the precursor of intolerable insomnia. Paraldehyde often answers well in large doses (60 to 90 minims), as it then will induce a drowsy or dreamy quiet state, extending well on into the following day, in which the craving for opiates may be weakened.

The plan of substituting cannabis indica or other narcotic *occasionally* may be tried, but generally it will not be found to do much good. Bromides in full doses always are helpful in quieting the unrest, though they often cause much depression.

Contrary to what he was led to expect, the writer has seen success more frequently follow the gradual plan where the hypodermic method had been the form of the opium vice than where opiates had been taken by the mouth.

OPIUM POISONING—See Poisoning.

ORCHITIS AND EPIDIDYMITIS.

Rest in bed in the horizontal position, lying on the back, is to be prescribed when this is convenient. A small board should be placed across the front of the thighs, upon this the scrotum can be supported as if resting upon a shelf. A board about as thick as the sides of a cigar box, only longer, with the upper edge bevelled in the middle so as to get well under the scrotum, answers the purpose well. A piece of broad strapping may be used in the same way, but it soon becomes permeated with moisture.

Where the patient must move about, a different method of obtaining rest for the inflamed gland should be sought. Any of the ordinary suspensory bandages may be tried. As a rule, they are much inferior for this purpose to one which the patient can extemporise for himself. This he does by tying a handkerchief, bandage, or girdle around the waist, to which another handkerchief (three cornered) is attached behind in the middle line, brought down between the thighs and fastened again in front of the waste girdle. In this way not only is efficient support given to the testicle, but whatever local application is selected it can thus be easily kept in contact with the scrotum, and at a later stage moderate continuous pressure may be kept up. Patients are found to devise various methods by which the suspension can be carried out by attaching the bandages to the braces or shoulders. At the onset, or as soon as the patient comes under notice, a smart saline purgative should be given. One ounce of Rochelle salt in a bottle of aërated lemonade is an efficient and palatable dose. In very plethoric subjects sulphate of magnesia may be given in teaspoonful doses, so as to keep up brisk purging for a time.

Where there is much constitutional disturbance a diaphoretic and antiphlogistic mixture like the following may be given:

℞.—Tinct. veratri vir. ℳxvj.
Liq. ammon. acet. ℥ij.
Vini antimonii ℥j.
Aquæ camphoræ ℥v.—M.

S.—One tablespoonful to be taken every second hour.

In very severe cases the saline may be preceded by one large dose of calomel, though there is generally little to be gained by this as the saline acts more quickly. Pulsatilla is said to have a specific effect in orchitis. It may be combined with aconite. The diet should consist of milk and kali water or whey, rennet, and mucilaginous drinks, solids and animal food being forbidden. One large opiate at night with bromide of potassium is a valuable method of giving ease and relieving pain. Local treatment is of importance. Where the patient is seen early a bladder of ice or a cold evaporating lotion continually changed is the best application. A cambric handkerchief, dipped in iced water, with small pieces of ice laid in between its folds is an efficient method of applying cold. Some surgeons employ a modification of Leiter's tubes.

Where pain and tension are aggravated by continuous cold, warm poppy fomentations are grateful, and even poultices, smeared over with the extract of belladonna, may be employed. Where orchitis occurs as a complication of parotitis this will be the safest plan of treatment. Where epididymitis occurs as a sequel of gonorrhœa, injections of astringent or antiseptic solutions must be stopped, and though the rule is laid down that all urethral medication must be sus-

pended, the writer has seen good results from steady perseverance with injections of warm water, sterilized by a few drops of Condy's fluid.

Where there is great pain, swelling, and tension, any of the following procedures may be adopted:

1. The scrotum may be painted over with a solution of nitrate of silver (1 : 6).
2. Leeches may be applied to the neck of the tumor or to the groin.
3. Any of the large scrotal veins may be opened with a lancet.
4. Several short incisions may be made into the swollen or œdematous tissue of the scrotum.
5. A fine trocar may be driven into the cavity of the tunica vaginalis, and any hydrocele fluid permitted to escape.
6. A series of punctures with a stout needle or fine trocar may be made into the substance of the testicle or swollen epididymis.
7. Pressure may be applied to the swollen gland either by means of plaster or the pressure of an elastic bag or suitable bandage. These plans of making compression are at first very painful, but are said to be soon followed by marked relief.

Seldom will any of these procedures be required. The great majority of cases yield in periods varying from forty-eight hours to six or eight days to the treatment first mentioned.

Collodion has been used as a mild method of causing compression, as it contracts after drying. Should signs of suppuration show themselves, a free incision into the fluctuating point should be made, and the wound treated by a weak sublimate solution or other antiseptic lotion, or dusted over with iodoform.

Where there is much induration or thickness left after the subsidence of the inflammation, the lin. potassii iod. cum. sapone, B. P., is the best local application, spread upon lint and applied to the scrotum. Over this, by strapping or by means of a laced elastic bag, firm and steady pressure may be continuously kept up. Some surgeons prefer to use mercurial ointment; the iodide liniment often brings out an eruption. Iodide of potassium should be given internally in these cases, after the subsidence of the acute symptoms.

Orchitis, or epididymitis following gouty inflammation of the urethra yields to rest, warm fomentations, or hot poultices, and the administration of full doses of colchicum wine combined with salicylate of sodium and the occasional use of cathartic doses of sulphate of magnesia.

Chronic orchitis being in the great majority of instances a syphilitic affection, constitutional as well as local treatment will be required. The constitutional remedy is, of course, mercury or iodide of potassium. There are few cases in which more marked evidence can be observed of the power possessed by these drugs in causing the absorption of inflammatory products.

The administration of mercury will be decided by the history of the case. In weak cachectic subjects who have suffered from syphilis very many years previous to the appearance of the orchitis, and who had

been previously brought well under the influence of mercury at least once before, it will be wiser to begin with large doses—10 to 15 or even 25 grains of the iodide of potassium three times a day. In all other cases mercury may be given in amount and in the manner indicated by the symptoms and history of the case. Thus in comparatively recent cases the patient should be brought under the influence of the drug without unnecessary delay by inunction or by the administration of moderate doses of any mercurial preparation. (See under Syphilis.) It will never be necessary to cause salivation, but the drug should be pushed until the gums are slightly touched, after which the effect may be kept up for long periods, without injury to the patient, until the induration in the testicle melts away.

In very chronic cases the iodide may be combined with mercury, and the writer has obtained excellent results from Donovan's solution:

℞.—Liq. arsenii et hydrarg. iod. ℥jss.
Aquæ dest. ad ℥iv.—M.

S.—One measured drachm to be taken after food in a wineglassful of water three times a day.

The bichloride of mercury may be given in a mixture with the iodide of potassium. The following is an efficacious combination in such cases:

℞.—Hydrarg. chloridi corros. gr. ij.
Potassii iodidi ℥ij.
Aquæ dest. ℥xij.—M.

S.—One tablespoonful after meals in water three times a day.

The mercurial suppository is a favorite means of administering the drug with the older surgeons. The younger school often resort to fumigation or vaporization in the treatment of syphilitic orchitis.

Local treatment may be summed up in the words pressure and mercurial ointment. Where hydrocele complicates the case—a very common occurrence—time will be saved by first tapping the tunica vaginalis, and, after the evacuation of the fluid, applying lint smeared over with ungt. hydrarg., and then, by means of strips of stout adhesive plaster, applying a firm pressure to the swollen gland.

Where the system is already under the influence of mercury, the mercurial dressing may be omitted and plain soap plaster applied direct to the shaven scrotum. This is often the only treatment necessary in dealing with a chronic orchitis which is not syphilitic, such as where considerable induration or enlargement follows the subsidence of an acute attack of orchitis or epididymitis, or follows upon an injury.

Where the induration is localized to a portion of the epididymis or body of the testicle, or in those cases where pressure cannot be tolerated, a little mercurial ointment may be rubbed in with the finger.

In non-syphilitic cases the best remedy to employ is the liniment of iodide of potassium with soap (B. P.). This may be firmly rubbed in with moderate pressure morning and night until the skin becomes tender. Iodine in the form of U. S. P. tincture, may be applied with a brush daily; it often causes much irritation and sometimes œdema of the scrotum.

When pain or tenderness exists the mercurial preparation may be diluted with an equal amount of the unguentum conii, or 10 to 15 per cent. of the green extract of belladonna may be combined with it. The oleate of mercury with morphine may be employed with benefit.

The following may be tried:

℞.—Oleati hydrargyri ℥iij.
Ungt. conii (B. P.) ℥iv.
Ext. belladonnæ ℥j.—M.

S.—Use as directed.

In malarial subjects quinine should be given in large doses. In gouty orchitis of a chronic nature, salicylate of soda may be given in doses of 15 grains twice a day, and ½ a grain of the extract of colchicum may be administered at bed-time every night.

When the above treatment has been followed out for a few weeks the organ generally diminishes in size and consistency, and the true testicular sensation returns. Rarely will castration be called for, unless in neglected cases where the surgeon may find the testicle hopelessly destroyed by abscesses or softened gummata. During the treatment by mercurials and pressure the patient can generally be permitted to walk about or pursue his usual avocation, all sexual exercises being strictly forbidden.

Close attention to diet, and to every means by which the general health can be improved must not be neglected, and at a later stage cod-liver oil, tonics, chloride of gold, or arsenic and strychnine combination with iron, and sea bathing will be very valuable.

OS CALCIS, Diseases of—See Caries and Necrosis.

OSMIDROSIS—See Perspiration, Excessive, and Bromidrosis.

OSTITIS—See Periostitis

OTALGIA—See Ear, Diseases of.

OTITIS—See Ear, Diseases of.

OTORRHŒA.

As this is but a symptom of some purulent catarrh or deep-seated lesion in the middle ear, the treatment recommended under the heading of Ear Diseases, page 221, is to be followed.

The most scrupulous cleanliness is to be maintained, while the remedies indicated for the treatment of the affection which has led to the otorrhœa are being employed, such as dilatation of the Eustachian tube, etc. Syringing with tepid water, to which enough Condy's fluid has been added as will just color it, is to be carefully carried out twice or three times a day, and after all accumulations of pus and thickened discharges have been flushed out by the stream of liquid, finely powdered boric acid is to be blown in with an insufflator. The haphazard methods of injecting irritating solutions as injections of iodine, pure spirit of wine, nitrate of silver, chlorinated soda or lime, strong carbolic acid, iodoform, chloral, sulphate of zinc, chloride of zinc, corrosive sublimate, etc., are to be strongly condemned.

Where the bland and unirritating action of the boric acid fails in diminishing the amount of secretion, a weak solution of the sulphate of zinc may be tried. Two grains to the ounce answer all purposes. When the fetor is very marked the amount of the permanganate of potassium, which is added to the tepid or warm water, should be gradually increased as long as its injection fails to produce pain. One grain of bichloride of mercury in one ounce of pure or absolute alcohol may be used as a solution in which a little cotton wool may be saturated and gently pushed loosely into the canal, where it may be left from time to time, the excess of solution finding its way toward the tympanic cavity. The plug should not be such as will interfere with the free exit of the purulent discharge.

Chrystie insists upon the *strictest* antiseptic treatment of purulent otorrhœa, and records cases where a few applications cured the disease when of many years duration. All specula, forceps, etc, are thoroughly sterilized with strong carbolic solution or red heat, the canal and fundus of the ear are carefully dried out by borated wool and the fundus mopped absolutely clean with carbolized(1 : 40) cotton tufts. After gently drying out, a powder is insufflated, consisting of six parts of boric acid and one part of iodoform.

M. Shield dwells upon the failure of producing a perfect aseptic condition in perforative otorrhœa by the use of lotions or insufflations, and he incorporates the antiseptic remedy with oil of theobroma by making a pellet or minute suppository which can be easily introduced into the meatus.

OVARY, Inflammation of.

The treatment of acute oöphoritis will consist of perfect rest in bed, in the most comfortable position which the patient can discover. This is generally lying upon the back with the legs drawn up.

One smart purge, such as 6 drachms of Rochelle salt, should be at once administered, and when it is slow in acting it may be hastened by using an enema of warm water.

Leeching is recommended, and the cervix, groin, and peritoneum

may be the seat of application. The writer has never seen a case requiring leeches.

Hot fomentations or poultices over which belladonna extract has been smeared may be used to give relief. Counter-irritation by means of cantharides, mustard, turpentine stupes, etc., may be tried, but for a time such measures appear to increase the pain. When this is very severe, opium is necessary; it may be given in very acute cases in the form of a full dose of the hypodermic injection of morphine ($\frac{1}{3}$ to $\frac{1}{2}$ grain), or as a morphine suppository ($\frac{1}{2}$ grain), or as 1 grain of the watery extract of opium, every four or five hours, by the mouth.

The best local application will be the following, sprinkled freely over a circular piece of spongio-piline and applied to the ovarian region (above the groin). It may be worn for hours, a little fresh liquid being sprinkled on from time to time:

℞.—Lin. belladonnæ }
Lin. chloroformi } āā ℥jss.
Lin. camphoræ ℥j.—M.

S.—To be used as directed.

As the violence of the pain subsides, the effects of the opiates may be kept up after their suspension by moderate doses of antipyrine, and 30 grains of bromide of potassium at bed-time.

Cannabis indica is a good narcotic when opium or morphine cannot be used.

At a later stage mild counter-irritation to the iliac region by a daily application of the tincture of iodine may be resorted to with advantage.

The treatment of chronic oöphoritis will tax the patience and resources of the physician to their utmost. Owing to the very chronic nature of the affection the treatment cannot be conducted upon the same principles as those which safely guide the physician in acute cases. Thus, absolute rest, to be of any value, must extend over periods so protracted as to seriously injure the patient's general health and vigor. Nor can opiates with safety be employed, as the danger of establishing the opium or morphine habit is very great.

Both these remedies may, however, be employed, under cautious restrictions, during the acute exacerbations which often supervene, especially about the menstrual period, when too much exertion or exposure to changes of temperature has been indulged in.

While every means is being employed to improve the general health, any possible cause of the ovarian irritation is to be carefully sought out and remedied. Constipation must be treated thoroughly, and the patient's own statements are not to be relied upon in this matter. It is not a rare event to find that upon making a vaginal examination the rectum or sigmoid flexure is loaded with feces,

though the patient may affirm that the bowels have been naturally relieved a short time previously, the rectum only partially expelling its contents.

Cascara and enemata of tepid or cold water must be daily employed (see the remedies mentioned under Constipation) until the bowels are brought into a healthy condition.

Chills to the extremities, and cold feet, prolonged standing, or wearying exercises must be avoided, and sometimes the occupation of the patient should be changed for one affording more regular alternations of open-air exercise and rest. Sexual intercourse should be very much restricted.

The only sedatives which can be employed with safety in such a chronic condition are the bromides. They may be given in full doses in combination with the iodide of potassium and a little belladonna or conium.

℞.—Sodii bromidi ℥iij.
Potassii bromidi ℥iij.
Potassii iodidi ℥j.
Tinct. belladonnæ ℥iij.
Aquæ chloroformi ad ℥viij.—M.

S.—One dessertspoonful to be taken three times a day in a wineglassful of water, after meals.

In addition to the sedative action of such a combination, it will have some absorbent effect upon any effused products resulting from the long-standing inflammation.

Antipyrine or antifebrin may be given in moderate doses during the periods when pain is more than usually prominent, or during the intervals in which the above mixture is suspended. Hydrastis is often very useful, and ergot may be advantageously given when subinvolution is present.

Local treatment may be employed in the majority of instances with marked benefit. It may be directed to probable causes, such as flexions or versions of the uterus or prolapse of the affected ovary.

A comfortably-fitting Hodge's pessary, with the posterior or sacral end composed of India-rubber, often gives great relief, as does also a rubber ring, with steel spring enclosed. They place the posterior cul-de-sac upon the stretch, and support both the relaxed uterus and the displaced ovary.

The writer obtains the greatest satisfaction in these cases from the introduction of a Graily Hewitt's cradle pessary, shaped like a Hodge bent upon itself in the middle, the two wings being connected in their middle and lowest points by a cross bar. Such an instrument, though difficult of insertion and still more inconvenient for removal, never falls out or gets displaced, and invariably gives comfort. If too large a size be used, the prolapsed ovary may be compressed between the posterior

wing of the instrument and the sacrum, though the writer has never known this to occur when the pessary is inserted upside down—*i. e.*, in the reverse position to that used for anteversion.

Copious vaginal injections of hot water may be used twice daily, and if the rectum pipe of the enema apparatus be carefully inserted by the side of the pessary, its presence will be no impediment to their use.

The writer hesitates to express an opinion upon a practice which has the sanction of eminent specialists; but he is inclined to believe that copious hot water vaginal injections, consisting, say, of one or two gallons, should not be permitted in patients moving freely about unless a pessary be worn at the same time.

Any ulceration of the os or cervix should be treated by appropriate remedies, such as the application of iodized phenol or nitric acid, though Barnes recommends that a small raw surface, produced by the application of London paste, should be kept open upon the cervix. The same result may be obtained by lightly brushing over the os with the iodized phenol or tincture of iodine.

Counter-irritation over the iliac or inguinal region by means of a small cantharides blister, kept open by dressing with D'Albyspere's or other irritating plaster, is often useful. Iodine, capsicum, or sinapisms may be substituted. The anodyne liniment, mentioned upon page 563, to be applied upon spongio-piline, may be employed to relieve pain, even when the patient moves about. Rest, as already mentioned, may be absolutely necessary at the menstrual periods, and when the exacerbations of pain become very severe, at this time hot sitz or very warm hip baths may be safely prescribed.

Electricity is often recommended; but in simple oöphoritis it may lead to increase of the pain, though occasionally a *weak* continuous current may be employed with great advantage by passing it through the lower part of the abdomen, between large electrodes, placed one over the ovarian region and the other over the sacrum.

By applying the positive pole to the cervix or interior of the uterus and the negative outside the abdomen, pain is often markedly relieved.

Uterine massage, with elevation of the uterus and gymnastic exercises, performed by forcible separation and forcible closure of the knees, have been much praised in the treatment of chronic oöphoritis, but there is room for very sharp differences of opinion regarding the wisdom of such a practice.

Where, notwithstanding all treatment, the affection continues to harrass the patient, the question of removing the diseased ovary or ovaries must be seriously considered. The after consequences must be weighed against the benefits lightly to accrue, and, if the patient consents, every other means having failed, the operation of removing the prolapsed and diseased organs may be undertaken. This may be done best, as a rule, by opening the abdomen in the median line and remov-

ing both ovaries, as in the operatian of ovariotomy. The removal of prolapsed and adherent ovaries by tho vagina is less satisfactory.

OVARIAN TUMORS.

The various methods of treatment which were in former times (before the brilliant achievements of modern surgery were dreamt of) employed, with the forlorn hope of curing or preventing the progress of the growth, have fallen into disuse.

Thus, drugs for internal administration, as iodides, mercurials, diuretics, etc., are known to be worthless, and are now never depended upon. Injections of iodine and other substances into the tumor are now little practised, though by injecting simple monocystic ovarian tumors in former years, sometimes excellent results were obtained. Sir James Simpson, for instance, had only one failure in twenty cases, though other surgeons have reported most unfavorably of the operation. It often fails entirely, and sometimes causes death; and the practice is now rapidly becoming replaced by excision. For multilocular cysts it is absolutely worthless, and only in typical cases of monocystic tumors, where the diagnosis is clear, is it worth trying.

In a large ovarian cyst of many years' duration which came under the writer's notice when its contents had become purulent, and were oozing through a minute orifice at the umbilicus, it was apparent that it had formed adhesions in every direction and to the abdominal wall, excision appeared to him to be out of the question, and he recommended one large incision into the suppurating cavity of the cyst where it was adherent to the parieties, and the establishment of thorough drainage and washing out with antiseptics. This was done with complete success.

Tapping or aspiration of the contents of an ovarian cyst is a practice which the most experienced specialists in this department are steadily condemning. In some cases of cysts in the broad ligament, their tapping has effected a cure, and Keith still adopts this method of treating all such cases; but for the treatment of cysts of the ovary, success is much rarer than the supervention of serious drawbacks, such as hemorrhage, peritonitis, suppuration, etc., which occasionally have caused death, or which often have led to the formation of extensive adhesions, the presence of which has seriously affected the removal of the tumor at a later stage.

There can hardly be a doubt about the wisdom of totally discarding the tapping of ovarian cysts as a means of cure, independent of excision or ovariotomy. In a limited number of cases the writer has seen one death directly follow tapping of a large cyst by a skilful surgeon. Occasionally, for purposes of diagnosis, tapping may be necessary, and it is well, if in such a case, the operation of ovariotomy could be immediately proceeded with.

Tapping is admissible as a method of giving relief in cases where an

operation is unjustifiable, as in a patient suffering from cancer or other incurable affection, or as a method of tiding the patient over pulmonary, renal, or other embarrassments, caused by the pressure of the tumor, until her general condition becomes so improved as to warrant operation.

The tapping should be conducted under the strictest antiseptic precautions. A long, fine trochar and canula, after being well washed in a weak sublimate or strong carbolic solution, may be plunged into the cyst in the middle line, midway between the umbilicus and pubes, as the patient lies upon her side close to the edge of the bed.

To the canula is attached a long piece of rubber tubing, the free end of which is dropped into a pail containing a little carbolic lotion. This precaution prevents the possibility of air being allowed to enter the cyst. The instruments devised by Wells, Thompson, Tait or Ward Cousins answer well. The writer has generally used the largest sized trochar and canula belonging to Dieulafoy's aspirator. Aspiration is seldom necessary, and large trochars, such as formerly were used, are not advisable.

After the contents of the cyst have been drained or syphoned off by the above method, a small pad of lint may be placed over the opening, and kept in position by a few strips of plaster, and a broad bandage or binder should be applied as tight as comfort will permit, and the patient should be directed to lie upon her back for the first twenty-four hours, as this may diminish the chances of the cystic fluid dribbling into the peritoneal cavity.

The operation of ovariotomy is, by the common opinion of surgeons, recommended to be undertaken before the tumor has assumed large proportions. It is admissible, however, in the most advanced stages of ovarian degeneration, and has become the safest and most satisfactory major operation in surgery, as remarked by Greig-Smith, who quotes the remarkable results of Tait, in which no death resulted after 139 ovariotomies. The reader is referred to any of the special works upon the details of ovariotomy, as only a brief sketch of the operation is here admissible.

The most suitable time for operating is about four to eight days before the next catamenial discharge is expected.

The patient should have the bowels well cleared out by a mild cathartic or warm water enema, and the catheter should be passed before the operation is commenced. No food is to be permitted for three or four hours before the administration of the anæsthetic, and then an egg beaten up with milk or a large cupful of strong beef-tea should be all that she is allowed. An ordinary night-dress over which a warm flannel jacket is worn, and woolen stockings on the legs, afford the most convenient and comfortable dress as the patient is placed upon the operating table. The front of the abdomen should be thoroughly cleansed by carbolic lotion; and after chloroform, ether, or A. C. E. mixture has been administered, and the surgeon has seen that every pre-

caution has been taken to avoid unnecessary chilling of the surface of the body during the operation by the suitable disposal of warm blankets or cotton wool, the abdomen is exposed and a large mackintosh sheet, sufficient to cover the trunk and to project beyond the feet of the patient, is laid over her. This sheet has an oval aperture, whose margins are smeared over with adhesive plaster, by means of which it is fastened to the abdominal parieties, leaving the sight of the incision uncovered and corresponding to the oval, while it covers over and protects from moisture the entire trunk and legs of the patient, and projects beyond the limits of the operating table as she lies upon her back with the head and shoulders slightly raised.

All instruments are to be soaked in warm carbolic solution (1 : 40), out of which they are to be lifted as required, and the operation should be performed under the carbolic spray (1 : 20). Sponges, after repeated beatings in order to remove sand, and frequent washings for *many* hours under a tap, should be soaked for *at least* twenty-four hours in a strong solution of carbolic acid (1 : 20 or 1 : 30). They should be carefully counted over before and after operation, prior to the closing up of the abdomen, so as to prevent the possibility of any being left behind.

Each operator has his own list of instruments. The following will meet most cases of ovariotomy: A scalpel or straight bistoury; at least one dozen of Wells's or Tait's hæmostatic forceps; one or two pairs of ordinary artery forceps; two pairs each of large and medium cyst forceps (Wells's or Nélaton's); one vulsellum; one Tait's large and one Wells's small or medium cyst trochar, with rubber tubing; scissors; one Adams's hook; two mounted pedicle needles; one needle-holder and needles; sutures; one clamp; cautery irons; drainage-tubes.

The incision is made in the middle line, its length depending upon the size of the emptied cyst, its lower limit should be two inches above the pubes, and its upper may be necessarily prolonged close to the left side of the umbilicus. Sometimes an incision two inches in length may suffice, and the writer has seen ten inches necessary in one case.

The first few strokes of the knife should divide for about two inches all the structures down through the fibrous aponeurosis until the transversalis fascia is reached. Bleeding points are to be secured by artery forceps, and the peritoneum is then to be opened by knife and director, or scissors, as in hernia operations.

With the exposure of the cyst the operator should at once proceed to tap it without venturing to explore or break down adhesions, and after the fluid has ceased to run, any secondary cysts are to be also emptied through the original opening or broken down by the insertion of the hand or fingers. When this has been accomplished the operator makes gentle traction upon the collapsed tumor, while he explores for adhesions, which are to be broken down by the fingers or by the pressure of a sponge if very soft and recent. In the separation of adhesions the greatest patience and judgment are necessary to determine

the amount of force justifiable. Adhesions which are so firm as to resist traction short of producing rupture of organs, must be treated by excising the adherent portion of the cyst-wall and leaving it *in situ*. After the removal of all adhesions the collapsed and flaccid cyst is gently extracted through the abdominal opening, which may have to be enlarged for this purpose. As the tumor is withdrawn from the abdomen, the pedicle is brought into view; the treatment of this is open to grave variations. Some surgeons tie it in one mass, others tie it in sections; the stump has been left outside, returned into the cavity, clamped, cauterized, twisted, tied with catgut, wire, and silk. The clamp and cautery method is still used by some operators, but the rule may be generally said at present to be transfixion of the pedicle by an armed mounted needle, and the tying of each half with a stout silk ligature, cutting the pedicle moderately close with a knife and dropping the ligatured end back into the abdomen. A large flat sponge is placed over the intestines as soon as the tumor has been extracted, and before the pedicle has been secured.

After the pedicle has been satisfactorily disposed of, the operator proceeds to clean out the abdominal cavity, removing by the gentle and diligent use of soft sponges squeezed out of warm carbolic lotion every vestige of blood or foreign matter from the peritoneum. Sponges held in long ovum or polypus forceps should be pressed down into the hollows about Douglas's space and frequently withdrawn and reapplied until there is nothing to take away. Tait washes out the abdominal cavity when there has been much foreign matter exuded. This he accomplishes by pouring in large quantities of warm water and moving the intestinal coils about with the hand until the water flows out clear. Any bleeding point caused by the separation of the adhesions is to be secured by catgut or silk ligatures, twisted or touched by the thermo-cautery or chloride of iron.

When the toilet of the peritoneum has been satisfactorily carried out, several dry sponges may be placed in the most dependent parts of the abdominal cavity and left there until just before the closing up of the wound by the approximation of the sutured edges. A glass drainage-tube (Keith's) should be inserted where there is any reason to expect weeping, especially in cases where there has been troublesome adhesion of the cyst-wall to the deep parts of the pelvis. The end of the tube should dip down deeply into Douglas's pouch. It will seldom be required in cases operated upon antiseptically. Sutures are to be carried through all the structures entering into the abdominal parietes, the lowest one being inserted first. The peritoneum is also to be embraced in the sutures, close to the margins of the wound. Before adjusting them all sponges are to be removed and the drainage-tube (when necessary) inserted. The edges of the wound are to be accurately brought together, without placing too much tension upon the sutures. A pad of several layers of carbolic gauze is laid over the line of incision, and held in its place by a series of broad strips of adhesive plaster, which

should extend from each loin to the opposite, so as to firmly support the entire abdomen. When this is properly done there is little necessity for an abdominal binder, though no harm can result from placing a neatly-fitting broad flannel bandage or binder over the whole, and where the distention has been very great a large pad of cotton wool or a large folded napkin may be secured in its place over the strapping by the flannel, so as to give additional support and to minimize the sensation of emptiness which the patient often feels.

The after-treatment of ovariotomy is of vital importance, and as it often falls into the hands of the ordinary medical attendant after the departure of the specialist who has operated, he should study it more carefully than the steps of the operation.

The best position for the patient after operation is upon her back in bed, upon a good hair mattress, with the shoulders and head elevated and the legs supported or raised by a pillow placed under the knees. It is, however, a mistake to insist upon this or any other position against the instinctive feeling of the patient should she desire to turn over upon her side. One matter must be impressed upon both patient and nurse—*i. e.*, that when a change of posture is desired it should be accomplished slowly and deliberately by the assistance of the nurse. Hot-water bottles or extra clothing for the first few hours may be necessary.

Regarding diet, Smith recommends for the first twenty-four hours nothing but small quantities of hot water or hot toast-water; in the next twenty-four hours a little oat-meal gruel or Brand's essence of meat given with the water. Afterward, he states, "If the case is doing well the patient may have almost what she asks for." This latter advice is to be accepted with caution, and unless the case is in the hands of a most discreet and experienced nurse, it should be the duty of the physician to look closely after the diet. If vomiting supervenes, a *little* ice may be permitted.

The writer has seen much mischief produced by ice administered too often and in too great quantities. When thirst is great, Smith's plan of giving an enema of one pint of tepid water is often most efficacious. The fear of inducing vomiting should lead the nurse to give as little of anything as possible by the mouth. Water may accumulate in the stomach after ice has been given too freely, and vomiting may be thus produced. When the operation has been a severe and protracted one, as soon as the patient is permitted two or three hours rest, three or four ounces of warm strong beef-tea should be injected into the rectum by an India-rubber bottle and pipe of a capacity not greater than the amount of the injection. Some operators begin and continue rectal feeding in every case as a matter of routine for the first three or four days. This is often unnecessary, and the risk of producing rectal irritation or uneasiness should not be lightly undertaken.

Milk is condemned as a food by many, but this is probably because

it has been injudiciously administered. After the first eight hours or so, a tablespoonful of milk mixed with an equal quantity of effervescing potash water, is a convenient, safe, and agreeable method of introducing nourishment into the stomach, but during the first twenty-four hours the total quantity administered should not exceed at the most 10 ounces of milk.

During the second day this amount may be doubled, if all goes well, and no nausea or vomiting be excited.

The milk may be, however, soon suspended for beef-tea, cold chicken jelly, or warm chicken soup, if relished. The danger to be avoided is in forcing nourishment too frequently upon the patient. Arrowroot, fine sago, or farola may be given in small quantities after the first twenty-four or thirty-six hours. Weak tea and thin bread and butter, or dry toast, may be permitted upon the third or fourth day, and fish, chicken, or a little lean chop upon the fourth or fifth, and after about the seventh day ordinary diet may be cautiously commenced. The complications and symptoms which occasionally arise will, of course, modify the above dietary, signs or symptoms of peritonitis forbidding the administration of animal food.

The routine practice of administering opium or morphine immediately after every ovariotomy is objectionable. These should only be given when pain is complained of. The best form is the morphine perule, and $\frac{1}{8}$ grain will generally be sufficient. It can scarcely be vomited owing to its minute size and spherical form, and perules, containing $\frac{1}{16}$ grain, may be given every two, three, or four hours, when necessary.

The forms of suppository and hypodermic injection are preferred by many, but the perules appear to check nausea and vomiting. In those cases where rectal feeding is necessary the opiate may be judiciously administered in the form of laudanum mixed with the enema.

Thornton recommends frequent washings out of the stomach by means of a soft rubber tube, where peritonitis exists in conjunction with bilious or dark vomiting.

Where tympanitis or severe abdominal distension supervenes early, the rubber tube may be passed up the rectum; but this seldom does any good, and it is a mistake in such a case to wait until the sixth or seventh day before having the bowels relieved. A smart saline purge given upon the third or fourth day generally affords speedy relief, and often appears to ward off the threatened peritonitis.

Four drachms of Rochelle salt dissolved in 5 ounces of aërated lemonade may be given, and repeated, if necessary, in five or six hours, though some physicians prefer a dessertspoonful of castor oil.

The catheter need not be passed for twelve or eighteen hours after the operation, unless the patient expresses uneasiness, as there is generally but a small amount of urine secreted at first. The catheter should be kept scrupulously clean, and each time before and after use it may be dipped into the glycerin of borax (1 : 6), which effectually

prevents the introduction of any living organism into the bladder or urethra. Its application should not be delayed beyond every twelve hours at the most after the first day. If the patient be unable to pass water without assistance, every eight hours will generally be found to answer.

The wound will require little attention. It need not be touched until the expiration of seven days, unless a drainage-tube has been inserted. Where this has been found to convey but a little oozing, it may be removed after the first day, and the aperture closed by a suture inserted loosely at the time of operation. At the end of the first week in ordinary cases the pad of gauze is to be removed with the strapping by bathing or moistening the parts with warm carbolic lotion. The sutures are also to be snipped and removed, a fresh pad of gauze adjusted, and bands of adhesive plaster applied as before to give support to the abdominal parieties. The binder may be re-applied, and the wound again left undisturbed for another week, at the end of which it will generally be found to be thoroughly united.

About fourteen days is generally found to be a sufficiently long period for keeping the patient in bed. After this time she may be permitted to sit up, and in three weeks may leave her apartment, and, if a suitable bandage is applied, she may be permitted to drive about. She should be cautioned to take rest and special care during the first and second menstrual periods succeeding the operation.

When the temperature is found to rise after the operation, it may be wise to give some simple diaphoretic mixture and await events. The surgeon should not attach too much importance to the elevation of temperature, as trivial causes may send the thermometer up several degrees, while dangerous peritonitis may be present with a fractional increase of body heat.

Where the fever continues high, some means must be employed to reduce it. The ice-cap, or Leiter's tubes to the forehead or scalp, is often resorted to. It is doubtful if these produce any marked effect in cases which warrant any antipyretic remedies.

Persistent high temperature must be met by prompt action, and hyperpyrexia, though rare, will probably soon prove fatal unless speedy reduction of temperature is effected by active remedies.

In one case—a patient of the writer's—the temperature reached 108° inside of twenty-four hours after the operation. In such a case probably no treatment is of any use, but the only means worth trying is the cold wet pack, which may be applied to the entire body, and the sheets so frequently changed or saturated with iced water until the temperature falls to the normal. Mild cases yield to iced cloths placed over the legs and thighs and arms, but in high temperatures the trunk must be also included in the pack.

Where the rise of temperature is persistently high, and accompanied with great distention of the abdomen, the surgeon should strive to treat the cause. Where this is owing to the accumulation and retention of

decomposing secretions within the abdomen, steps should, if possible, be taken to give exit to the offending matter when the condition of the patient looks grave.

This may be accomplished by the removal of the sutures from the lower half of the wound, and the thorough washing out of the abdominal cavity by a copious stream of warmed antiseptic liquid, as weak carbolic lotion or boric solution. The surgeon should introduce his fingers or hand into the cavity, and separate any agglutinated coils of bowel, and in bad cases of peritonitis the abdomen has been successfully re-sponged out and the wound sutured up again. In all such cases there must be free drainage established, and the glass tube should be inserted deep into Douglas's pouch with the collar resting between the edges of the abdominal wound. A loose roll of carbolized or iodoform gauze is placed inside the tube, and a carbolized sponge over its open extremity. When the tube remains *in situ*, the gauze in its interior draws up any moisture. This percolates also into the sponge. These should be renewed every eight or ten hours under the carbolic spray, and sometimes, when the discharge gets scanty, a Tait's suction apparatus may be employed.

Some surgeons in these cases puncture the pouch of Douglas through the vaginal walls by means of a long trochar and canula which is left in the wound, or a drainage-tube is inserted as the canula is withdrawn.

The temperature, when depending upon causes such as have been referred to, generally falls upon the drainage being provided. If not, it is certainly worth while to give an antipyretic. Quinine is not generally reliable. The amount necessary to make a decided impression upon the temperature often upsets the stomach and digestion. Antipyrine is safe and convenient, and may be given in doses of 15 grains every four or six hours until the temperature falls to normal. In peritonitis this must be given by the rectum, as vomiting is so constantly present. For the same reason all feeding by the mouth must be given up, and the patient should be fed entirely by enemata of beef-tea or peptonized foods. Greig-Smith's routine enemata consists of: 1 ounce of brandy, 1 drachm of Valentine's liquid beef, or 1 drachm of Brand's essence, or 1 drachm of Benger's peptonized jelly, and 4 ounces of peptonized milk.

This is to be given every four or five hours, and once in the twenty-four hours an enema of tepid water, to the amount of 1 pint, is to be administered, and the rubber rectum-tube worn for about an hour before each enema.

These precautions are necessary, as it is most undesirable and sometimes dangerous to allow the decomposing or putrid remains of the enemata to lie and accumulate in the rectum, especially as the mucous membrane may have suffered some abrasions from the frequent introduction of the anal tube.

With the rectal feeding, and *small* quantities of ice by the mouth,

and an antipyretic when needed, there only remains for the peritoneal inflammation full and continuous doses of morphine. The best way to administer this is to give one full dose by the hypodermic method, after which the effect may be kept up by giving a perule containing $\frac{1}{16}$ grain every hour by the mouth until the pupils are markedly contracted and pain relieved.

Turpentine enemata rarely do any good, and they may seriously interfere with rectal feeding by setting up irritation.

OXALIC ACID POISONING—See under Poisoning.

OXALURIA.

There is no special or specific treatment for this condition. In every case the first thing to do is to determine the cause of the impeded metamorphosis, and have this removed or corrected. Where this is caused by some error in digestion or assimilation, suitable tonics are indicated, and by far the most valuable are the mineral acids, 20 minim doses of the diluted nitrohydrochloric acid in infusion of calumba being very useful. When over-eating is the cause, especially when much animal food and acid wines are indulged in, the best treatment will be a wise regulation of diet and strict temperance in all things. Often rhubarb brings on very severe oxaluria, and saccharine foods sometimes produce the same effect.

The writer has seen the condition disappear upon changing the eating habits of the patient. Thus the heavy dinner indulged in after partially fasting all day may be the cause of oxaluria, and by getting the patient to dine in the middle of the day, and to take a light meal in the evening, the amount of oxalic acid or oxolate of lime becomes rapidly diminished. Large eaters should take a bottle of simple carbonated or aërated water instead of tea; concentrated soups are not to be recommended.

Want of free exercise in the open air often leads to retarded metabolism, and a change of life in this respect may lead to the speedy disappearance of oxaluria when the ill-ventilated office or workroom is abandoned for the fresh breezes of mountain or seaside resorts. Sleeping-room ventilation should be looked after, and the bedroom window left open all night is an advantage. For the anxious, overworked city clerk who drives to his small office in the morning, and drives home again in the evening to spend the hours until bed-time in the close atmosphere of a gas-heated room, the suggestion of tricycle or bicycle exercise is a good practice.

Sleep should be sound and natural, and all conditions interfering with this must be attended to, neuralgia, insomnia, overwork, or high pressure being remedied as far as this is possible.

Sea bathing, the Turkish bath, or, better still, a good shampooing or massage after perspiration has been induced by brisk or even violent

exercise, is of use. The morning shower bath is to be recommended, and the clothing should be warm and waterproof.

Roberts recommends the administration of small doses of the bicarbonate of potassium when the signs point to gastric irritation, and the mineral acids when atonic dyspepsia is present.

To sum up, the treatment of oxaluria will consist in the vigilant and persevering lookout for the violation of some health law, which, being discovered, should be at once remedied.

OZÆNA.

The treatment of this unpleasant affection may be summed up in the words—absolute cleanliness. Where this is rigidly and perseveringly carried out, the worse cases may be expected to yield.

The great difficulty in dealing with ozæna is to remove the thickened secretion upon whose presence the fetor depends. Every crust should be washed away, and no mucus be allowed to accumulate. As long as secretions are permitted to remain, decomposition speedily sets in, and the diseased surface is never placed in a condition favorable for healing. Hence the necessity for the persistent use of the nasal douche, which consists of a soft rubber tube, with a nose piece at one end and a lead sinker at the other. This latter is dropped into a jug of warm water, in which a teaspoonful of common salt or bicarbonate of sodium is dissolved, and after starting the fluid to run syphon-wise through the tube, the jug is elevated as the end of the douche is inserted into one nostril. By keeping the mouth wide open the soft palate is raised and the posterior nares cut off from the mouth and pharynx, and as the water flows in through one nostril it courses around the nasal chambers and flows from the other nostril.

This should be continued until every trace of thickened secretion is removed, and at first, or in neglected cases, hot fomentations and inhalation of steam may be employed to assist in the removal, and where the dried discharge adheres to the roof of the nasal cavity, an ordinary enema syringe may be employed to wash it out, or it may be mopped out by pledgets of cotton wool twisted around a probe.

After a few applications of the douche, its constant employment becomes a comparatively easy matter, and if used three or four times a day, the mucus or pus has not time to desiccate, and a few minutes are sufficient to cleanse the cavity. During the douching, the nose-piece should be taken out of one nostril and inserted into the other.

When the crusts are removed, and antiseptic solution should be substituted for the salt or bicarbonate of sodium liquid. Every known substance possessing deodorising properties has been recommended or used, of which a few are subjoined:

Permanganate of potassium (1 grain or 1 drachm of Condy's fluid to 10 ounces of water).

Chloride of zinc, 2 grains in 10 ounces of water.

Sulphate of zinc, 8 grains in 10 ounces of water.
Jayes' disinfecting liquid, 20 minims in 10 ounces of water.
Carbolic acid, 1 drachm in 10 ounces of water.
Sanitas fluid, 1 tablespoonful in 10 ounces of water.
Chlorinated soda solution, 1 teaspoonful in 10 ounces of water.
Nitrate of silver, 4 grains in 10 ounces of water.
Sulphurous acid, 2 drachms in 10 ounces of water.
Alum in powder, 30 grains in 10 ounces of water.
Borax, 40 grains in 10 ounces of water.
Chlorate of potassium, 20 grains in 10 ounces of water.
Tannin, 30 grains in 10 ounces of water.
Tincture of iodine, 15 minims in 10 ounces of water.
Boroglyceride, 2 drachms in 10 ounces of water.
Boric acid, 1 drachm in 10 ounces of water.
Naphthol (see below), 5 to 10 grains in 10 ounces of water.
Hydrate of chloral, 5 grains in 10 ounces of water.
Bichloride of mercury, 1 to 2 grains in 10 ounces of water.

Any of the above solutions may be used, and the surgeon will be wise who confines himself to the use of any one or two of them, instead of changing from day to day. The astringents in the list may be selected where the discharge is copious, and the deodorizers are indicated in proportion to the amount of fetor present.

Beta-naphthol has been most successfully employed by Rualt. He washes out the nose with a fresh solution of 60 grains of borax and the same amount of bicarbonate of sodium, in 1 pint of water, to which a teaspoonful of the following solution is then added—*i. e.*, naphthol (beta-naphthol), 1 drachm, dissolved in 1 ounce alcohol (90 per cent.). In obstinate cases he inserts for fifteen minutes, after using the above, cotton tampons saturated with the following:

℞.—Naphthol (beta-naphthol)		gr. xij.
Tinct. quillayæ		℥jss.
Aquæ dest.	 q. s.	℥j.

Sidlo has obtained excellent results by the use of glycerin. He washes out with a 2 per cent. solution of potass. chlor., to which 10 per cent. of glycerin is added. After removal of all thickened secretion, he inserts for one hour daily, cotton tampons saturated in glycerin, 1 part, and water, 3 parts.

Rossenbach paints the interior of the nose with Peruvian balsam, and leaves tampons saturated with it in contact with the deeper parts of the cavity. This treatment effectually destroys all fetor.

Boric acid, bismuth, camphor, tannin, calomel, and iodoform, suitably diluted with chalk, sugar or starch, have been used for insufflation, but they are less satisfactory than liquid preparations.

After the use of any of the above irrigating liquids, the speculum may be employed, and any ulcerated spots may be touched with strong

solutions of the same antiseptic agents, with iodized phenol, ethyl iodide, chloride of iron, ethylate of sodium, the galvano- or thermo-cautery, nitrate of silver, or nitric acid.

As a rule, ulcers rapidly heal under constant irrigation by weak saline or antiseptic solutions.

When diseased bone is present, little improvement may be expected until this has been removed, which, as a rule, can be easily accomplished by seizing any loose bone in a pair of small sequestrum or stout dressing forceps, and gently dragging it through the nostril. When the dead bone is too large for removal in this way, or when it cannot be easily reached, Rouge's operation of turning up the lip, and dividing the mucous membrane and all the structures above the anterior teeth by a horizontal incision, may be tried. After detaching the cartilaginous septum from the anterior nasal spine, the finger may be passed into the nasal cavity, and by the aid of suitable forceps any diseased structures may be removed.

Löwenstein uses, with great success, the new drug aristol or iodide of thymol, in ozæna, and relates the details of a case where iodoform failed entirely, and where insufflations of aristol caused the intense fetor to vanish, the ulcers to speedily heal, and the crusts to cease from forming.

Syphilitic ozæna will require similar local treatment, a very weak solution of corrosive sublimate (1 : 5000 or 1 : 10,000) being freely used for irrigation. Any ulcerated spots will require to be cautiously touched with the solution of nitrate of mercury, and loose or diseased bone must be removed. Calomel may be insufflated in such cases with advantage.

Constitutional treatment is of great importance in ozæna, and is as urgently required in the strumous as in the syphilitic cases, the remedies suitable for these varieties being noticed under scrofula and syphilis.

In every case the general health is to be maintained by good food, pure air, change of scene, tonics, cod-liver oil, iron, iodides, arsenic, quinine, sea bathing, etc., from the very beginning of the local treatment.

PAGET'S NIPPLE—See Nipple, Disease of, page 542.

PAIN.

The treatment of pain will be detailed with the treatment of various diseased conditions in which pain is a prominent symptom, as neuralgia, cephalalgia, peritonitis, sciatica, megrim, etc.

PALATE—See Cleft Palate

PALPITATION—See Heart, Diseases of.

PANCREAS, Diseases of.

Of the pathology and symptomatology of these affections little is known, and of their treatment still less. In malignant disease the treatment will resolve itself into measures for the relief of pain, though surgical treatment has been advised, but the operations cannot be considered justifiable in the present state of our knowledge. Acute and hemorrhagic pancreatitis are practically beyond the reach of art.

Cystic disease of the pancreas has been successfully operated on by tapping, by abdominal section and attempted excision, and by establishing permanent fistulous openings in the abdominal parietes and other methods. Of all plans the most uniformly successful is that of incision and drainage.

In one case where a large tumor formed after a severe injury to the abdomen, the writer tapped the tumor, the contents of which were found by Professor Matthew Hay to consist of pure pancreatic juice.

Gallons of this fluid were removed from time to time, but the patient did not suffer from any of the symptoms supposed to always follow the arrest of the secretion of the gland, though the enormous quantities of fluid, possessing in a very active form all the physiological qualities of undiluted pancreatic juice, continued to be removed by the aspirator for many weeks. The tumor, after one of the tappings, rapidly filled up with a bloody liquid. Symptoms of peritonitis supervened, and the patient made a rapid and complete recovery, and remained perfectly well five or six years after the tappings. When last seen, the pancreas showed no signs of the presence of any cystic growth, the patient being well nourished and vigorous. In chronic pancreatic disease the use of pancreatized food or of Benger's preparation is indicated.

Calculi, when detected, may be submitted to manipulation or taxis which has been successful in a few cases. If this fails, abdominal section may be entertained.

PANNUS—See Conjunctivitis, page 138.

PARALYSIS—See under Hemiplegia, Spinal Meningitis, Myelitis, Caries of Vertebræ, etc.

PARALYSIS AGITANS.

The treatment of this affection is most unsatisfactory; eminent authorities have reported great improvements in several cases following the use of remedial agents, which, upon further clinical experience, have proved valueless. The most hopeful therapeutist will hardly be likely to continue to push drugs which do not give evidence of doing some good inside a reasonable time, and yet the best treatment may be

found ultimately to consist in the exhibition of some agent whose action is very slow. The writer has prolonged the trial of various substances generally to find that in the end the case pursued its own course. The reports of cases which speedily commenced to improve after the use of certain agents are not to be wholly discredited. The explanation possibly lies in there being a moral or psychological effect following their administration. Reports of cases where a permanent improvement or cure followed the use of any line of treatment are exceedingly rare, though it is related that Brown-Séquard cured one case with chloride of barium, Elliotson another with subcarbonate of iron, and Reynolds a third with galvanism applied to the spine.

The best effects are probably secured by the prolonged use of arsenic internally and a continuous current applied to the affected muscles or limbs. Fowler's solution may be given in doses, commencing with 3 minims, increased gradually to 10 minims three times a day after food, and a current from 8 to 16 Leclanché cells may be sent through the affected region daily for ten to twenty minutes. Sometimes good effects have been observed by injecting Fowler's solution (2 or 3 minims) subcutaneously, or deeply into the muscles.

Chloride of barium appears to possess remarkable power over some cases, It may be given in doses of $\frac{1}{3}$ grain, three times a day.

Valerian, in large doses, 10 grains of the extract, or dessertspoonful doses of the simple tincture may be tried. The writer has seen good effect from the valerianate of zinc, but only when given in such doses as cannot long be taken without upsetting the digestion and appetite, and causing headache—*i. e.*, 5 to 8 grains three times a dry. No result follows the ordinary dose of 1 or 2 grains.

In hyoscine we have a remedy about whose action there cannot be any doubt. Erb has given it with remarkable benefit. It acts speedily, and has been found to stop the movements with tolerable certainty, and often they have been found not to return for a considerable period after the action of the drug had ceased. It is given hypodermically in doses of $\frac{1}{250}$ grain of Merck's preparation.

As yet there is, however, little evidence forthcoming of its permanent effects, and in an affection of such long duration there are grave objections to the use of powerful remedies which only give temporary relief. (See fifth edition of the writer's volume on *Materia Medica*, page 572.) In severe cases of the disease where the movements seriously interfere with the patient's rest, it is of the greatest possible advantage to possess such a remedy, and by its use life may be comfortably prolonged; but such cases are rare. Moderate support to the affected limb may be also of use in severe examples of the disease, though anything like restraint as bandaging to splints, etc., aggravate the mischief. Bandaging may be useful in the early stages of the disease. In very mild cases of short duration a mixture like the following may be given for long periods:

℞.—Tinct. hyoscyami ℥jss.
Liq. Fowleri ℥iij.
Tinct. valerianæ ℥iijss.
Glycerini purif. ℥v.—M.

S.—One measured drachm to be taken three times a day after meals in a little water.

Strychnine, phosphorus, atropine, iodide of potassium in large doses, opium, calabar bean, chloral, bromides, ergot, curare, and many other drugs have been employed, but with very little benefit to tempt one to hope for permanent improvement.

Cod-liver oil and iron may often prove useful in improving the tone of the general health, and hydropathy has unquestionably done good. In the next case falling under the writer's care, he intends to try the effect of massage, performed for a long time.

Recently, suspension, as used in the treatment of locomotor ataxia, has been recommended. (See page 458.)

PARALYSIS, Diphtheritic.

There are few affections in which the physician may more safely indulge the hope that by his interference he can often prevent a fatal syncope and save life.

The treatment of diphtheritic paralysis is simple, it resolves itself chiefly into a question of *feeding*. The disease is certain to disappear completely if the patient's life can only be sustained long enough for the elimination of the poison causing the paralysis. This is, however, sometimes a very slow process, and when the cardiac or respiratory muscles are affected there is great danger of a sudden wind up to the case, and the physician must be on the look-out for the first symptoms of cardiac weakness which are to be met by free stimulation and ammonia. In the very onset of the paralysis, occurring sometimes within a few days after recovery from diphtheria, or during the course of the disease, the heart muscle may be the first to suffer from weakness, and when the first symptoms of this are overlooked by the physician, sudden death may be the first change which shows the effect of the diphtheritic poison. As soon as the pulse, or temperature of the chilled extremities show any evidence of cardiac weakness, the patient must be treated with promptness. He should be put to bed and warmth with friction applied to the limbs, while a small sinapism is applied over the heart, and whiskey or brandy given in warm milk, both by the mouth and by the rectum. Ammonia, in the form of strong liquor may be applied to the nostrils and sal volatile in full doses, well diluted, may be administered every fifteen or thirty minutes, while faradization of the præcordial region may be resorted to in severe cases.

In the more common form of the affection where the weakness be-

gins in the lower extremities or in some of the peripheral muscles, as in the eye or palate, the paralysis comes on at a later period often within a fortnight or month after recovery from diptheria; though the danger of sudden cardiac failure is much less, these cases are apt to be very tedious, and before recovery almost every muscle in the body may become paralyzed. Feeding should be rigorously attended to, and as soon as swallowing becomes difficult or impossible rectal alimentation must be commenced. In every way that is possible the nutrition of the body is to be improved, and when the appetite is weak, tonics, such as the well-known combinations of quinine, diluted nitro-hydrochloric acid, and tincture of bitter orange, are to be resorted to. Moderately active exercise in the open-air when exercise is possible, and when walking is difficult, the patient should be carried out to sit or recline in the sunshine, or be pushed in a bath-chair. Where these are impossible, as in the middle of winter, indoor exercise and general massage may be tried, and the appetite coaxed in other ways, as by unusual variety of choice and carefully cooked foods administered often.

When digestion shows signs of failing, pepsin wine may be freely given after every meal, or a little alcoholic stimulant may be permitted. Food should be peptonized, and all enemata must be partially digested before administration. (See page 171.) In bad cases the patient should be roused up at least once during the night to receive nourishment, and in the case of children this must be done oftener.

The writer has seen a patient almost completely paralyzed after diphtheria, in which swallowing even of liquids was altogether impossible. Standing was out of the question, the patient being unable to turn in bed, and respiration threatened to stop from respiratory paralysis. Recovery ensued in this apparently hopeless case by rectal feeding with peptonized beef tea, milk, and eggs, and inunction with cod-liver oil, and the application of the cod-liver oil bandage already described (page 507.)

Drugs are useful; but before referring to their internal administration it must be emphasized that they hold a secondary place in comparison with the importance and value of feeding by the mouth and rectum.

Iron is the most reliable. It may be given at any stage of the affection, and in any form which the peculiarities of the case suggest. It appears to do best in those cases where it was not freely administered during the progress of the primary affection. The dialyzed preparation appears to act better than any other, especially as it is much less likely in large doses to interfere with the digestion or bowels. Some authorities strongly recommend the various natural iron waters, and when combined in the form of an effervescing mixture they agree when the dialyzed liquor or the favorite carbonate or saccharated carbonate is not relished. Small doses should be tried

when large or full quantities disagree. Blanchard's pill of the iodide of iron may be administered for long periods without giving rise to unpleasant results.

Arsenic is sometimes useful; but it is only indicated in very tedious cases, and then when combined with iron.

Strychnine or nux vomica is a remedy of great value; but it should never be given in the acute stages of the paralysis. In the later stages it may be given by the mouth, or in very chronic cases it may be injected with much benefit into the weakened muscles.

The following is a good routine formula for internal administration:

℞.—Strychninæ		gr. jss.
Tinct. ferri chlor.		ʒiv.
Quininæ hydrochlor.		gr. xxxv.
Glycerini purif.		ʒj.
Aquæ dest.	 ad	ʒiv.—M.

S.—One measured drachm to be taken three times a day after meals in water.

Electricity is open to the same objection as strychnine—*i. e.*, that in whatever form administered it does harm in the early stages. As a later period its value cannot be doubted, and in a very chronic case the writer found that improvement ceased as soon as galvanism was suspended. 1. A weak current may be passed from the spine to the affected muscles. 2. The healthy contractility and irritability of the muscles should be maintained by placing the kathode of a continuous galvanic battery upon the skin over the motor points, and then rapidly making and breaking contact by alternately applying to and withdrawing the anode from the skin over some indifferent places near to the affected muscles. 3. Local faradization of the muscles may be practised with beneficial results. 4. A weak continuous current may be sent through the peripheral nerves of the affected limb or region. The applications of electricity should be only made from five to ten minutes once daily. 5. Static electricity may be employed.

Where the paralysis has resisted all these means, and the muscles continue to waste, massage may be tried two or three times a day, and stimulating embrocations and even blisters have been advised. The Chilli paste containing powdered capsicum is an excellent local application, though Cormack preferred a paste composed of—

℞.—Pulv. zingiberis		ʒvj.
Pulv. sinapis		ʒij.
Adipis præparati		q. s.—M.

S.—To be used as directed.

With this paste circular bands of linen or lint, about an inch in breadth, are smeared and applied at intervals of five or six inches to

the whole length of the limb for several hours daily. By changing the position of the bands the entire surface of the limb may be kept in a state of continuous mild counter-irritation. After the partial subsidence of the irritation, deep or parenchymatous injection of small doses of strychnine affords the best chance of speedy recovery.

PARALYSIS OF FACIAL AND OCULAR MUSCLES—See under Paralysis Peripheral.

PARALYSIS, Infantile,

or acute atrophic paralysis, or poliomyelitis anterior acuta. Where the physicion is fortunate enough to see the case at the very beginning, or where he is still more fortunate in being able to make a diagnosis, antipyretics and diaphoretics are indicated; but *absolute rest* at this stage is the chief indication. The ice-bag to the head and spine has been advised, but its utility is doubtful. A smart saline purge following a moderate dose of calomel should be tried, and afterward iodide of potassium in moderately large doses may be given.

Most cases, however, do not come under observation until the paralysis has been thoroughly established for a variable time, and, as the only remedy to be relied upon in the treatment of infantile paralysis is electricity, the question at once crops up—what is the earliest period at which the use of this agent is justifiable? This question may be answered easily by stating that if a mild or very weak continuous current be judiciously used the treatment may be commenced generally as soon as the patient comes under observation—*i. e.*, toward the end of the first week or middle of the second. The writer used galvanism earlier than this in one case with much benefit; but if the faradic current be employed it will be wise to postpone its application until a later period.

This current, though used by Duchenne, should not be employed in the early stages when a continuous battery can be obtained. It is painful, and, in the case of children, generally causes great excitement. Moreover, owing to the reaction of degeneration being established, the weak continous current will provoke strong and slow contractions where the faradic current produces nothing but pain and irritation. Hence in the treatment of acute atrophic paralysis we may safely make a rule of always employing the weak continuous current at the onset, and as long as the muscles fail to react to faradism.

The galvanic current is applied in two ways, large sponge electrodes being employed, one being placed upon the vertebræ behind, and the other on the front of the body, and by changing or reversing them in this way a moderate current may be made to transverse the affected region of the cord in both directions for about two minutes daily. The other method is of more importance. It consists in galvanizing the affected muscles by placing the anode on the spine, while the kathode is passed over the muscles, contact being made and broken frequently.

Both methods may be tried at each sitting, which should last for a few minutes at first, until five, ten, or fifteen minutes daily be spent in this way for several months. Excellent results follow even when this treatment has been delayed for many months, and some authorities have reported great improvement even after twelve or eighteen months, but the greatest perseverance and patience must be exercised, and the current must not be strong. At a later stage the continuous may be suspended for the faradic current with advantage from time to time, and this applies also to the treatment of the chronic form of atrophic paralysis as well as to the acute, whether occurring in children or adults.

Massage of the affected limb is of the greatest service. The nurse or mother of the child can be easily taught to carry this out two or three times a day by pinching up and rolling the affected muscles between her middle finger and thumb, and the writer has obtained excellent results by rubbing in cod liver oil at the same time. Stimulating applications, as the liniment of camphor, Chilli paste, or the paste of rose Cormack mentioned under Diphtheritic Paralysis, may be also used; and local brine baths, or sea-bathing and hydropathy, are very useful. Strychnine may be tried by the mouth and hypodermically. The later method is sometimes of great value when the daily injections of $\frac{1}{50}$ grain are carried down into the muscles. Tonics, as quinine, iron, arsenic, cod-liver oil, and malt extracts, with change of scene and plenty of good food and fresh air, are essential. Contractions of unopposed muscles must be met by appropriate orthopedic measures and gymnastics.

PARALYSIS, General, of the Insane.

The treatment of this hopeless malady has hitherto been purely expectant, but a new era in its history has been marked by Claye Shaw. Believing that the pathological appearances pointed to irritative (probably inflammatory) processes in the upper layers of the convolutions in the earlier stages, and to the pressure of resulting fluid, and remembering that increased arterial tension was generally a marked sign, he was led to trephine at an early stage in the disease. He believed that in this way he could relieve tension, and set up a changed nutritive process, and consequently H. Cripps trephined a patient upon the right side of the skull over the central sulcus, about two inches outside the longitudinal fissure, making two apertures and removing the intervening bone, leaving a window about one and a half inch long, and about half this extent in breadth.

The dura mater was excised and a considerable quantity of subarachnoid fluid removed, and the most marked improvement rapidly followed. The mental signs of exaltation, and convulsive attacks which had been present disappeared, and the patient became quite sane.

PARALYSIS, Alcoholic.

If the patient be seen in the early stage of the disease there will be every reason to believe that an absolute cessation of indulgence in alcohol in every form will enable him to recover. Suckling has pointed out that recovery may be even expected where the disease has lasted over a year. If, however, the muscles fail to respond to the interrupted current, and the reaction of degeneration be present, he points out that treatment must be very perseveringly tried before benefit begins to appear. Treatment in all cases will consist in total abstinence from every form of alcohol, rest in bed, the judicious use of the continuous and interrupted currents, with daily massage and counter-irritation by means of a series of flying blisters over the course of the nerve-trunks.

Internally and hypodermically strychnine is the only remedy to be relied upon. The general management of the case may be carried out upon the lines mentioned under Diphtheritic Paralysis.

PARALYSIS, Peripheral.

Under this heading may be included all cases of local paralysis not depending upon disease of the spinal cord or brain; it includes paralysis of spinal as well as of cerebral nerves. The chief indication for treatment will be, in the first instance, found in the removal of the cause, when this is possible. Diligent search should be made in every case for any compression upon the nerve in its course. Tumors of various kinds, and abscesses may, by pressing upon the nerve-trunks, produce both sensory and motor paralysis, and in such cases removal of the cause must be accomplished before any improvement can be expected. Reflex causes, as carious teeth, are to be treated upon similar principles. Blows, over-exertion, exposure to cold and damp, and other common causes will also afford obvious indications for treatment.

The routine management of the paralysis is such as has been already mentioned under Diphtheritic Paralysis, *i. e.*:

Counter-irritation to the nerve-trunk and entire limb.

Massage applied to the affected muscles.

Strychnine hypodermically in the later stages of the affection.

Electricity—using the form of current which is found to most easily produce muscular contractions in the affected limb.

The most suitable method for the majority of cases will be found in placing the anode over the nerve-trunk, on the skin above the lesion or over some indifferent part, and applying the kathode over the motor points as contact is rapidly made and broken. The "labile" method may be used with great advantage by placing the anode over an indifferent part, as the kathode is slowly moved over the skin covering the affected muscles and nerves; or the "stabile" method may be tried. Large moistened sponge electrodes should be used. In any case the

faradic current should be occasionally employed, the electrodes being applied directly over the affected groups of muscles in turn.

In paralysis affecting the facial nerve, and often known as Bell's paralysis, the mild cases get well rapidly without any treatment, but in the severer form of the affection the resources of the physician will be sometimes severely taxed. In the early stage leeches may be applied behind the ear and to the auricle. One large blister applied over the mastoid process is, however, likely to be followed by better results than local blood-letting. Hot fomentations and poultices are to be avoided, as are also sinapisms. After leeching or blistering, a very large and thick pad of absorbent cotton-wool is to be applied over the side of the head, and kept in its place by a bandage or night-cap with strings. One large saline purgative having been administered, the following mixture should be commenced:

℞.—Potassii iodidi ℈iv.
Potassii bromidi ℈vij.
Syr. aurantii ℥jss.
Aquæ camph. ad ℥viij.—M.

S.—One tablespoonful to be taken in water, after meals, three times a day.

This may be continued during the first three weeks of the affection.

There is much difference of opinion regarding the time at which electrical treatment is to be commenced, and also regarding the form of electricity best suited for the affection. The writer believes that the best results are obtained from faradization commenced early (within the first week). He bases his conclusions upon a limited number of cases, but of one of these he was himself the patient, having suffered from a severe attack after exposure in a snow storm in 1872. Erb believes that the constant current is of little benefit until the restoration of the conductivity has occurred. The kathode should be placed over the paralyzed muscles while contact is made and broken, and when the continuous current is selected the breaks should be rapid. This current may, with great advantage, be used when, from paralysis of the chorda tympani and the filaments going to the stapedius and palate muscles, it is shown that the seventh nerve is affected high up. In these cases a weak continuous current may be passed through the head by placing an electrode over each mastoid process. The same result may, however, be brought about reflexly by faradization of the fifth nerve on the face.

In chronic cases the writer has seen unmistakable success follow the injection of strychnine over the site of the chief branches of the nerve in the face. He has injected $\frac{1}{25}$ grain, beginning with 2 or 3 minims daily of the B. P. liquor (1 : 100).

Bichloride of mercury in small doses is indicated after the iodide has had a good trial, and, where there is any reason to suspect syphilis, it may be administered from the beginning.

Paralysis of the third, fourth, or sixth nerves (peripheral) is to be treated upon the same principles—viz., leeches and blisters behind the ear or over the temple, large doses of iodide of potassium, and, in syphilitic cases, of mercury. Galvanism is also useful, and may be employed by passing a very weak continuous current through the eyeball and brain by placing the anode over the occiput and the kathode over the closed eyelid.

PARALYSIS, LANDRY'S—See Myelitis.

PARALYSIS, LEAD—See under Plumbism.

PARALYSIS FROM PROGRESSIVE MUSCULAR ATROPHY OR WASTING PALSY.

The remarks made under the head of Infantile Paralysis apply, almost without modification, to the treatment of the present affection. Drugs are practically of no value. Any benefit to be expected can only be obtained from electricity, and this may be applied in the same manner as for infantile and diphtheritic paralysis (which see). The usual nerve remedies may, however, have a fair trial—arsenic, phosphorus, chloride of gold, and iodides can do no harm, and they may be given with cod-liver oil, Where a syphilitic history is clear, great good may be obtained from large doses of the iodide combination with small quantities of the bichloride of mercury.

The general health is to be maintained in the highest state of perfection, and great care should be bestowed upon the clothing, the patient being well encased in flannels, and if the affection is vigorously and persistently treated by galvanism from the earliest stages there is a fair prospect of improvement. The writer has seen marked improvement for a time to follow the use of the continuous current, even when the disease was advanced.

PARALYSIS, Pseudo-hypertrophic.

The treatment of this affection is almost hopeless. Probably the few cases which recover are uninfluenced by the remedies which have obtained the credit due to the *vis medicatrix naturæ*, though Duchenne thought that at least two cases yielded in his hands to the faradic current. Bourdel and Henoch also each report a case where electricity was successful in the early stages. Both forms of current may be steadily employed, and Benedikt galvanizes the sympathetic.

Massage, brine baths, and hydropathy may also be tried; but little may be expected from the plan of Greisinger, who advocates the compression of the calf muscles by bandaging.

In the later stages no treatment appears to have any effect, and until something is definitely known about the pathology of the disease little can be expected from drugs. Arsenic, strychnine, iron, iodides, phos-

phorus, etc., have been tried without result. The writer reported a case in the *Medical Times and Gazette*, about seven years ago, which had a unique history. The patient, who was much improved by galvanism, had shown symptoms of the affection from a very early age. He was a twin boy, and his brother did not develop the affection.

PARALYSIS FROM SPINAL CURVATURE—See Spinal Curvature and Caries.

PARAMETRITIS—See under Pelvic Cellulitis (page 591).

PARAPHIMOSIS.

The surgeon grasping the penis behind the glans between the middle and index-fingers of his interlocked hands, pulls the foreskin forward, while at the same time he presses back with both thumbs the swollen glans until it slips behind the constriction. This is the usual method. The writer prefers to grasp the penis behind the glans, between the index and middle fingers of the left hand, near to the metacarpo-phalangeal joint, while with the index finger and thumb of the right hand, or with the last joints of all the fingers of the right hand, he surrounds the swollen glans, and steadily reduces the swelling by patient continuous pressure until its bulk becomes greatly reduced, when it generally slips through the constricting band, sometimes painlessly. The success of the ordinary method is chiefly due to the forcible traction of the prepuce forward, and in the latter method to the reduction of the glans through the strictured ring almost by the same gentle manipulation as in a hernia. The glans may be reduced in size by winding a rubber band around it, but the steady pressure of the fingers is better.

Where these means fail, which should be seldom, except in cases of neglect, there is no use in waiting to apply ice, but after chloroform the taxis may be again tried, and if reduction is not possible, the surgeon looks for the site of constriction, and divides it with a sharp-pointed curved bistoury, taking care to make his vertical incision close to the glans *behind* the collar of swollen preputial tissue and not in front of it, as the appearance of the parts might suggest. The glans should be forcibly depressed by the tip of the left thumb as the incision is being made, and as the narrow preputial orifice is divided, reduction is easily accomplished.

PARAPLEGIA—See under Myelitis (page 513).

PARONYCHIA—See Onychia (page 553).

PAROTITIS—See Mumps (page 512).

PEDICULI.

The destruction of these parasites often gives considerable trouble, and to effectually banish them some knowledge of their habits is essen-

tial. Thus, the ordinary body louse is seldom seen upon the skin, and as it resides in the seams and creases of the clothing, it cannot be destroyed until the garments are subjected to the action of heat or reagents which kill the parasite. It must also be kept in mind that agents which are destructive to the pediculi may have no effect upon their ova; and since these are not hatched until after the expiration of nine or ten days, the case cannot be regarded as cured until after this period has elapsed. After the total destruction of the parasites and their ova it may be sometimes necessary to treat the eczema or other lesions to which their presence has given origin.

Pediculi capitis. In mild cases which have not been long neglected there is no necessity to cut or shave the hair, but in hospital this must often be done, and when once thoroughly accomplished there is no trouble afterward, as the ova are also removed adhering to the hair. Shaving is, however, almost impossible, owing to the numerous crusts and scabs. Close clipping by sharp scissors answers every purpose, and a good washing with soft soap completes the destruction of any straggling vermin or adhering ova.

In ordinary cases a remedy should be prescribed which, though capable of destroying the pediculi rapidly, should not be of such a nature as to injure the patient, even if injudiciously applied. This is a matter of vital importance in large charity or other schools, where mercurial preparations should not be used. The favorite old-fashioned remedy is a safe one, viz., the ointment of stavesacre (B. P.), which is made to contain 10 per cent. of the oil. This, when rubbed into the roots of the hair or used as a pomade, effectually destroys the lice, but does not reach the ova contained in the nits. If the application be continued for a fortnight every trace of the vermin is removed, the young pediculi being killed as they are hatched.

Where there are many crusts a soft linseed-meal poultice, smeared over with carbolic oil (1 : 15), speedily destroys the mature parasites, or a few minutes under the carbolic spray is still more efficacious.

For large numbers of children, especially in female industrial schools and similar institutions, there is not any remedy equal to paraffin or common petroleum oil, mixed in the proportion of 1 part to 1 or 2 of olive oil. When this is used as an ordinary hair-oil these vermin are never seen, and by using it the writer has found that the pediculus corporis soon disappears from the children's clothing. He has known the undiluted paraffine oil to be extensively used as an ordinary hair oil for long periods without causing any irritation whatever.

In cases where a rapid effect is desired and where skilled nurses are entrusted with the management of children, as in a children's hospital, a weak solution of bichloride of mercury may be employed. But one of the best of all applications is the ointment of the ammoniated mercury, or white precipitate (1 : 10), as it not only destroys the parasite, but effectually relieves the eczema or impetigo which has resulted from

the scratching and irritation caused by its presence. When there is much secondary skin affection present, petroleum should be used with caution.

For the treatment of the nits or egg-cases, the hair may be well soaked in strong alcohol after washing with soft soap, or vinegar or solution of borax may be applied; and after they have become loosened from their moorings by these solvents, a very fine comb easily clears the hair of them.

Many other agents are employed, such as naphthol, solutions of tobacco and cocculus indicus, chloroform, dalmatian flowers, peppermint, cajaput, anise or clove oils, decoction of laurel leaves, quassia, pellitory, creolin, etc. They possess no advantages over the more commonly used remedies.

Shoemaker adopts the excellent plan of incorporating the paraciticide with soap, and his corrosive sublimate and naphthol soaps are elegant and effective remedies for these pests.

The objectionable odor of paraffin may be overcome by making it into an ointment or pomade with lard or vaseline, and adding some balsam of Peru.

Pediculi corporis are to be abolished by cleanliness. As they live and deposit their ova in the seams of the clothing, the most effective method of dealing with them is to place the clothing for a few hours in a hot chamber or disinfecting-room, so as to thoroughly bake the pediculi and their eggs. Boiling the clothes answers equally well. In treating school children for itch by sponging their bodies over with the solution of pentasulphide of calcium (see 5th edition of *Materia Medica and Therapeutics*, page 517), the writer found that pediculi also disappeared when the clothes were immediately put on again. The white precipitate ointment may be smeared over the shoulders and armpits; and if it does not speedily cure the accompanying eczema or prurigo, other measures, such as alkaline baths, and inunctions of olive oil, may be prescribed.

Pediculi pubis or crab lice may prove very difficult to eradicate, especially when the parasite affects the various regions of the body in hairy men. When confined to the pubes a few applications of strong carbolic lotion (1 : 20) may destroy them, but the eggs are not likely to be affected by this. The writer has seen them effectually abolished by painting the parts once with the glycerin of carbolic acid (1 : 4), but this is a severe remedy, and only applicable where the parasite is limited to a small area. Solution of corrosive sublimate (2 grains to 1 ounce) may be freely applied where the beard, whiskers, eyebrows, or chest are effected. The most manageable application, however, is an ointment of white precipitate (25 or 30 grains to 1 ounce of lard). This may be frequently smeared over the affected regions without any danger of salivation, and if a little paraffin oil be added a most efficacious parasiticide may be obtained.

℞.—Hydrarg. ammon. gr. xxxv.
Olei petrolei ʒ ijss.
Bals. Peruviani ʒ j.
Lanolini ad ʒ viij.—M.

A 5 per cent. calomel ointment is also generally efficacious, and Bernbeck advises a bath of 4 drachms of corrosive sublimate in 30 gallons of water as a remedy for all pediculi. Of all the mercurial preparations the speediest and at the same time the safest is that of Brocq. He uses a solution of 1 grain of corrosive sublimate dissolved in 1 ounce of vinegar, and states that this kills both the parasites and their ova at the same time.

The common practice of rubbing in the strong mercurial ointment over extensive regions of skin is objectionable and dangerous.

Iodoform ointment, or even the application of iodoform gauze, is often effective.

Chloroform destroys both the parasite and ova by one thorough application, but it is liable to cause serious cutaneous inflammation or irritation.

Ether spray is equally efficacious, and very much less irritating, and it may be applied over any large tract, as over the front of the chest and pubes, without danger.

PELVIC ABSCESS.

The treatment will be in the early stages the same as for any deep-seated inflammation or abscess (see under Abscesses.) Thus, rest, opium, leeching, hot fomentations, poultices, enemata or occasional salines, are indicated. In the later stages, when suppuration has occurred, the treatment applicable to the later stages of pelvic cellulitis (which see under the following heading) should be carried out.

PELVIC CELLULITIS OR PARAMETRITIS.

If seen in the earliest stage of an acute attack, the patient should be at once ordered to bed, and if a rigor or shivering fit ushers in the attack the usual remedies necessary to restore reaction should be employed, such as a little warm stimulant internally and hot water bottles to the feet; but at this stage a diagnosis is scarcely possible unless the affection supervenes upon some pelvic irritation which had previously suggested the possibility of parametritis supervening. As the symptoms and signs of the affection develop they are to be dealt with upon general principles. Thus absolute rest in the horizontal position is to be maintained. The diet is to be exclusively milk, or liquids such as might be permitted in fever. The bowels should be cleared out by an enema of tepid water, and an occasional saline purgative may be safely administered.

Hot water injections may be freely resorted to from the very begin-

ning. The water should be as hot as can be borne, and two or three gallons may be used at a time, the temperature being gradually increased until 108° F. can be tolerated with comparative comfort. If the injection of hot water aggravates the patient's pain or discomfort it must be stopped. Any harm, however, likely to arise from this method of treatment will probably consist in the temperature of the water being too low. Less than 100° at the beginning of the injection should not be tried, and even 110° may be reached and maintained with safety.

Hot fomentations, poultices, lotions, or compresses may be applied over the abdomen during the intervals between the syringing. The best application will be a large piece of spongio-piline squeezed out of very hot water, and sprinkled with laudanum, and bound moderately tightly by means of a calico binder. This can be worn continuously, and will not be interfered with by the syringing, which must be carried out as the patient lies upon her back in bed. As a rule, the warm applications having been commenced are to be kept up constantly until the termination of the inflammatory action.

Pain is to be subdued by small doses of opium often repeated. It is a good plan to begin with a pill containing 2 grains of powdered opium, and to keep up the effect by given ½ grain every two, three, or four hours, according to the severity of the symptoms. Any simple diuretic combination may be given if the skin keeps dry and hot, or the opium may be prescribed in the form of Dover's powder.

Antipyretics proper are not indicated in the very early stages, but any time that the temperature runs up to 104° or more, 10 or 15 grains of antipyrine may be administered, and repeated when necessary.

Leeching is the only form of blood-letting admissible, and many authorities recommend a dozen or more leeches to be applied over the skin above the groins, about the anus, perineum, or even to the vagina or cervix. The writer has never seen a case where such practice was likely to do good.

Quinine is clearly indicated in septic cases, and 4 grains with ½ grain of the watery extract of opium may be given every three or four hours. Iron may be useful in such cases if it agrees with the state of the digestive organs.

Mercury is liable to be given too freely in pelvic cellulitis. It is of most unquestionable value in the opinion of the writer, but salivation is to be deplored. It is never necessary to touch the gums, nor does it appear to be good practice to exhibit the drug until after the appearance of the dense solid exudation has been evident for some time. When given in small doses it hastens resolution. From a limited experience, which does not, however, justify the writer in drawing a general conclusion, he is led to suspect that the drug, if given too early, is liable to favor suppuration, but if withheld until the fluid part of the exudation has become absorbed, it gives a better chance of satis-

factory resolution, and it gives best results when combined with quinine and opium, as in the following:

℞.—Hydrarg. chloridi mit. gr. ss.
Quininæ sulphatis gr. ijss.
Ext. opii gr. ss.—M.

Make twenty-four of these.

S.—Take one three times a day.

Iodide of potassium is very useful at a still later stage, and it may be given safely in doses of 10 to 15 grains where smaller doses cannot be tolerated.

Complications must be met as they arise. Thus vomiting will be best relieved by ice and a simple saline or effervescing mixture containing a little hydrocyanic acid, while smart counter-irritation by a large sinapism applied over the abdomen is also useful.

Diarrhœa should not be checked, especially if the motions are *very* decidedly offensive. The writer has observed this in several cases where pus had formed, and he is inclined to regard it as a valuable sign of the absorption or infection of the system when rigors fail to warn. It is an indication for large doses of quinine and stimulants, and for the suspension of mercury or iodides, and the continuation of poultices and hot vaginal douches tinged with a little Condy's fluid.

Sleeplessness is best met by sulphonal, and not by increased doses of the opiate. In chronic cases resolution may be hastened by counter-irritation with strong liniment of iodine or small blisters, and at a very late stage, long after the subsidence of all inflammatory action, by massage and the use of the continuous current (50 to 80 or 100 milliampères), with one pole in the vagina and the other over the pubes.

When, in spite of the above measures, the inflammatory exudation softens and suppuration occurs, the case becomes one of pelvic abscess, poulticing must be continued, and the diet increased to the fullest extent of the digestive powers of the patient, strong soups and beef essences being freely administered. Pointing must be watched for anxiously. Speaking generally, one may say that at this stage the less interference or the fewer examinations the better. The mischief which may be wrought by the sound or the speculum should be kept in mind. In the vast majority of cases, the slower the process by which the matter travels in the direction of the least resistance the safer for the patient. Doran insists upon the danger of aspiration. The writer has never seen it used at this critical time without some mischief ensuing, except when a fine needle has been inserted for diagnostic purposes. All the skill, discretion, and experience of the surgeon will be required in deciding whether the abscess should be opened or left to nature. The probability is, that if a mistake be made it will be by interfering. Where the abscess points toward the

surface there can be little if any danger in waiting, and if opened too early, owing to the rigid state of its infiltrated walls, it does not readily collapse, and air easily enters. Hence, when opened, which should not be under ordinary circumstances until almost ready to burst through the skin, a free incision should be made under antiseptic precautions, and a drainage-tube inserted. Afterward the cavity should be gently washed out daily with warm solution of boric acid, very weak bichloride of mercury solution, or Condy's fluid, but irritating substances like iodine or chlorinated liquids are not to be employed. A large pad of iodoform gauze may be placed over the opening, or, if the discharge is very free, carbolic tow or teased oakum may be selected.

When the matter bulges into the floor of the pelvis, and is felt in the rectum or vagina, the question of making an opening or leaving the case to nature is to be speedily decided. Aspiration is out of the question. One of two courses may be determined upon, if interference is necessary at all—viz., either to plunge in a bistoury and evacuate the abscess at the most prominent part in the vagina or rectum, or else to thrust in a large curved trochar and canula, driving the canula home after the trochar has been removed, as described under the treatment of Hæmatocele. In either case the largest sized drainage-tube should be inserted through the opening made by the bistoury or through the canula, when in position, before being withdrawn. Through the drainage-tube (a large winged rubber catheter may be employed) the abscess cavity may be frequently washed out by a warm solution of boric acid or other mild unirritating antiseptic once or twice daily.

If the surgeon can satisfy himself that the abscess is not bulging toward the peritoneal cavity, but is pointing in the one safe direction—*i. e.*, toward the vagina or rectum—interference is a mistake; but it is not often that one can satisfy himself upon this point, and where there are reasons to suspect that to wait for the discharge of the abscess through the vaginal wall would be to incur the risk of its bursting into the peritoneal cavity, incision should be made at once.

When the evidence is clear that the abscess has burst into the peritoneum there still may remain much to be done, as a fatal issue is almost certain if the case be left alone, and it will become then a question of the advisability of performing abdominal section. Unquestionably life has been saved by opening the abdomen under such circumstances.

The horizontal position and rest are to be maintained for several weeks after apparent recovery. Where drainage is being carried out the patient may be placed in such a position as to ensure the most complete evacuation of all discharges.

In the stage of convalescence, tonics, change of air, iron, cod-liver oil, syrup of the phosphates, with peptonized foods and malt extracts, are useful.

PELVIC HÆMATOCELE—See Hæmatocele, Pelvic, page 304.

PELVIC PERITONITIS.

The treatment of this affection will be best carried out by adhering to the principles just laid down for the management of pelvic cellulitis.

In both conditions preventive treatment should play a most important part, and the conscientious accoucheur who adheres to a system of cleanliness, carried out with the greatest scrupulosity, will see much fewer cases of this class than will fall to the lot of him who fails to recognize the enormous amount of mischief which may follow a careless or slovenly style of obstetric or gynecological practice.

Absolute rest, opium, warm fomentations, or poultices and leeching may be indicated. Where hot applications are not tolerated Leiter's tubes, cold compresses, or ice may be tried. Fever may be present to an extent sufficient to jeopardize the patient's chances of life, and antipyretics may be necessary from the very commencement. Upon the whole, where the digestive organs are in good condition, and when the temperature is not very high, the safest and most efficacious treatment will be to administer quinine in combination with the tincture of chloride of iron; 5 grains may be given dissolved in 20 minims of the tincture diluted with 2 ounce of water. This acts well in cases where there are obvious septic causes at work. Where the temperature rapidly mounts to a great height, as in cases of puerperal fever, as a rule quinine is not to be depended upon, but large doses of antipyrine (20 grains), antifebrin (10 grains), or salicylate of sodium (30 grains) may be given at intervals. Where suppuration occurs the abscess is most likely to point toward the vagina, and the same rules are to guide the surgeon as if a case of suppurating pelvic cellulitis was under treatment. (See Pelvic Cellulitis.)

Saline purgatives, which are so beneficial in some cases of cellulitis, are to be used with more caution in peritonitis, and when an action of the bowel is required an enema of tepid water may be employed. The practice of locking up the bowels for two or three weeks is certainly to be condemned in ordinary cases. In all cases of this nature, when a purgative must be given by the mouth, there can hardly be a difference of opinion about the safest drug. Castor oil in small doses never does any harm.

PEMPHIGUS.

In a disease presenting such widely differing symptoms and signs as pemphigus, the treatment will necessarily vary very much at different stages of the affection. For the acute disease, rest in bed, and a liquid or milk diet, may be indicated. In the chronic or the foliaceous form, upon the other hand, the chief treatment will consist in the administration of the most nutritious foods and in the greatest amounts prac-

ticable. As in many other diseased conditions in which we feel at a loss for indications for treatment, through our ignorance of the pathology or etiology it is customary to advise that every other departure from health is to be sought for and remedied as far as possible by improved hygienic surroundings, altered diet, drugs, change of habits, scene, etc.

Of the drugs for the treatment of pemphigus there is one which, though it sometimes fails utterly, nevertheless in many cases it appears to exert a specific influence, and it should always be administered freely and for a considerable period. Arsenic should be prescribed as soon as the temperature becomes normal in acute cases, and at all stages of the chronic varieties of the disease. It is, however, of little use in the foliaceous form. The dose of 3 minims of Fowler's solution should be rapidly increased to 6, and afterward to 9 minims three or four times a day, immediately after meals; and though some patients may be met with in whom 15 minim doses may be tolerated for long periods, it is a good practice not to venture beyond three doses of 10 minims each in the twenty-four hours. It is needless to say that it should be well diluted before administration. In chronic cases the arsenic should be combined with iron. Cod-liver oil and quinine are also both of some value in the foliaceous form of the disease. The cod-liver oil may be given in tablespoonful doses of the Kepler extract preparation, immediately before or after a mixture containing 7 or 8 minims of Fowler's solution and twice as much tincture of iron.

Where arsenic, after an honest trial, fails, chlorate of potassium in large doses may get a good trial; it has succeeded in some cases. Anderson, however, recommends the hypodermic injection of arsenic when it fails by the mouth, and he even combines quinine with it.

Iodide of sodium in full doses (5 to 15 grains) may also get a trial. Belladanna, guaiacum, phosphorus, antimony, and even mercurials have been recommended, but unless when arsenic has completely failed in the foliaceous form their administration is not worth a trial.

In pemphigus vegitans, Pollock and Hutchinson advise an early resort to opium in full doses. This variety is always fatal.

Local treatment will depend upon the stage of the affection. In acute cases, characterized by great tension in the bullæ, these may be pricked with a suture-needle or lancet and dressed with zinc ointment or any bland unirritating salve. Powders freely dusted over the weeping surface are in some cases better, especially when excoriations are present. Among dry applications of this sort are finely-powdered Fuller's earth, oxide of zinc, chalk, starch, prepared calcamine, oleate of zinc, etc., either alone or mixed in such proportions as the appearance of the parts indicates.

Unna's paste is a convenient and grateful preparation. It may be prescribed by ordering:

℞.—Cretæ præp.
Zinci oxidi
Olei lini
Aquæ calcis
āā ℥j.—M.

S.—To be used as directed.

Lotions are sometimes preferable to either ointments or powders, and Secretan has most successfully treated pemphigus pruriginosus by continuous applications of compresses soaked in a 1 per cent. solution of carbolic acid. This effectually relieves itching and hastens healing.

The writer has used the ordinary carron oil, to which 1 or 2 per cent. of carbolic acid is added, for chronic cases. Cripps reports success from the application of oleate of mercury.

In very tedious cases of the foliaceous variety the physician will feel his resources taxed, and the best plan is to permit the patient to lie in the tepid bath for several hours daily, after which the excoriations may be dressed with zinc ointment, to which 5 or 10 grains of calomel per ounce may be added. Two or 3 drachms of corrosive sublimate may be added to 30 gallons of water as a mercurial bath, but the patient should not rest in this for any considerable length of time.

Baths are fitted up in which the patient can eat and sleep, and Kaposi has found these of the greatest benefit in very chronic cases associated with much prurigo or itching. Bran, gelatin, carbolic acid, or tar may be added to them. In one very obstinate case of foliaceous pemphigus the writer obtained considerable benefit by the use of the continuous current, but the patient left hospital before the treatment was completed.

Where the mucous membrane of the mouth is affected, the constant use of the glycerin of borax (1 : 6), gargles of chlorate of potassium, or tablets of the chlorate with borax, are the best local applications.

PERFORATING ULCER OF THE FOOT.

The treatment of this affection is at the best unsatisfactory and tedious, as it is always associated with some nerve lesion, like tabes dorsalis. The cause should receive careful attention, and complete and permanent healing of the ulcer may be expected in a percentage of cases. The advice given by surgeons who are apt to recommend amputation of the foot should not be seriously entertained until the failure of medical treatment has been demonstrated. In one case which the writer saw with Dr. Wales, permanent healing occurred after the use of the continuous current. This was applied in various ways for several months, chiefly by dropping one pole into a foot-bath of tepid water, while the other pole was applied to the sciatic region, or held in the hand.

The remedies suitable to the treatment of the primary lesion should be steadily persevered in at the same time, and the anæsthesia soon

begins to get less and less. In tabes dorsalis, chloride of gold, arsenic, iodide of sodium, antipyrine, and suspension should have a fair trial, but it is upon electricity that dependence is to be placed. The ulcer may be dressed by any stimulating ointment, as the unguentum diachylon, or by very weak nitric acid, bichloride of mercury solution, or spirit lotion, by means of a piece of lint covered with tinfoil or thin sheet lead.

When diseased bone is present, it should be removed by the gouge or forceps, and if the wound is very sluggish it may be occasionally brushed over with a strong solution of nitrate of silver or touched with strongest nitric acid, or acid nitrate of mercury solution, or even brought into light contact with the thermo-cautery, or scraped thoroughly with a Volkmann's spoon. When all these measures fail, a Syme's or a Teale's amputation may then be seriously considered.

PERFORATION OF STOMACH AND BOWELS—See under Gastric Ulcer, Typhoid Fever, Perforative Peritonitis.

PERICARDIUM, Dropsy of.

In the majority of cases this will yield to active treatment, directed against the cause of the hydropericardium. Thus, if it be part of the general anasarca of Bright's disease, the best measures will be diaphoretics (hot baths), diuretics (digitalis), and cathartics (sulphate of magnesia). Where the fluid remains stationary or continues to increase, there is nothing left but to tap or aspirate the pericardial sac.

This is not an operation to be undertaken without an accurate knowledge of the anatomical structures in the front of the thoracic cavity. Unless previous tapping has failed, the practice of making an incision with a sharp bistoury into the pericardium is not to be thought of.

After mapping out the area of dulness, and ascertaining, as far as possible, the limits of the heart, as the patient lies upon his back with his shoulders raised, a fine hypodermic needle may be inserted, and some fluid withdrawn, in order to verify the diagnosis.

The needle puncture may be made almost anywhere, but it is better to make it in the same spot into which the aspirator, trochar, or needle is to be afterward inserted. This spot is of importance, it must be near to the sternum, and the left is the side generally selected. Some surgeons go close to the sternal margin, others advise keeping one inch, and some recommend the puncture to be made two inches from the margin of the bone, in order to avoid the internal mammary artery. The fourth or fifth interspace is the best, though the sixth or seventh may be selected in some cases.

The operation may be successfully performed by perforating the fourth or fifth space upon the right side, though upon the whole, it would appear that the left fifth interspace close to the sternum is the best, though either side may be selected.

The needle should be inserted upward so as to avoid the heart, and

the fluid must be very slowly withdrawn. It is a good plan to detach the aspirator, and keep the end of the tube under a little carbolic lotion, while by a syphon action the cavity is slowly emptied. An ordinary hydrocele trochar and canula has been used, but the aspirator needle is better. The needle should be kept steady while the fluid is being withdrawn, though it does not appear that pricking of the ventricular walls is of necessity a serious mishap. Wheelhouse inserts the trochar on the upper surface of the fourth rib to the left of the sternum, and advancing it steadily upward from left to right, until the cardiac impulse could be felt, withdraws it, leaving the canula in position.

Should the fluid be found to be purulent, the tapping will probably require repetition, and though the treatment in this case should be detailed under the head of pericarditis, it may be mentioned here for convenience. Drainage in this case will be essential. The passage of a fine drainage-tube through the canula would meet all the requirements of the case, but this will generally be found impracticable, owing to the narrowness of the canula, hence, an opening must be made with a sharp scalpel or bistoury. The best site for the incision will be that of the previous punctures.

The incision should be made as recommended by Cheron, the tissues being incised layer by layer for a distance of three or four centimetres (rather more than one inch) taking care to avoid the internal mammary artery, which may, if necessary, be drawn upward. The exposed pericardium may then be caught up in forceps and opened by means of a guarded bistoury. Antiseptic precautions should be taken both in the tapping as well as in the cutting operation. The greatest care must be exercised should irrigation be deemed necessary, though such a procedure is not desirable, and irritating antiseptics must not be employed. If considered absolutely necessary, a little warmed boric acid or permanganate of potassium solution may be used.

PERICARDITIS.

The diseased condition which has led to the inflammation of the pericardium will demand treatment, and in many cases this is all that is necessary, and as the affection is commonly a complication of or sequel to acute rheumatism, the reader will find the anti-rheumatic treatment under the heading of Rheumatism. The special treatment will be almost identical with that of endocarditis, which see upon page 239. The following is a brief enumeration of the remedies indicated: Absolute rest in the horizontal position, poulticing, leeching, blisters, or milder counter-irritation, opium to relieve pain, digitalis at a later stage (5 minim doses) to strengthen the heart, and at a still later stage *small* doses of mercury are useful. When pericarditis occurs as a complication of pleuritis or pneumonia, in addition to the employment of the above agents, the remedies indicated for these diseases must be pushed. Where it occurs in connection with septic conditions or ulcerative endocarditis, active supporting measures must be resorted to as

extra feeding, stimulants, sulphocarbolates in large doses (25 to 30 grains), quinine to the extent of inducing cinchonism, and iron in full doses.

Where the amount of fluid is so large as to threaten life the pericardium may be tapped with a fine aspirator needle, and when suppuration has occurred, provided the primary lesion is not necessarily a fatal one, life may be saved by opening and draining the pericardial sac. Both these operations are described upon the previous pages under the heading of Pericardium, Dropsy of.

PERIHEPATITIS.

Is generally an accompaniment of peritonitis, of hepatitis, or cirrhosis, or even of cancer of the liver, and its treatment will consist in the exhibition of the remedies suited to these different affections, while pain is relieved by opium or morphine internally, and poultices, blisters, counter-irritants, leeches, or local anodynes externally.

PERINEPHRITIS.

Pain must be relieved by hot linseed poultices, warm fomentations, or mild counter-irritants, and some still believe that the free application of the liniment of iodine, if applied early, may prevent suppuration.

Of internal remedies, tonics, such as quinine and large doses of iron may be prescribed, but these cannot be expected to do more than improve the general health, and no law can be laid down except that remedies are to be used to combat symptoms as they arise.

Boric acid in 10 grain doses may be given where calculous pyelitis is the primary lesion, and this is often the case.

As matter forms, a free incision should be made with a sharp bistoury over the softest spot in the lumbar region posteriorly, skin, fascia, and muscles being divided under strict antiseptic precautions, and a large drainage-tube should be inserted after the evacuation of all pus and sloughs.

PERINEUM, Fistula of—See under Urinary Fistula.

PERINEUM, Rupture of

The prevention of this complication at delivery is detailed under the head of Labor. When the rupture occurs, if only of small extent, it may be safely left to nature, the most rigid cleanliness being observed afterward by frequent sponging of the parts with a warm antiseptic solution as weak Condy's fluid or carbolic lotion.

Where the laceration has extended through a considerable portion of the perineum, as already mentioned, after cleansing the torn surfaces, one, two, or more deep sutures should be inserted with a large curved needle, and the margins of the wound brought into accurate

position. This operation to be successful, should be performed immediately after the birth of the child, and the bowels should not be disturbed for three or four days, after which a warm water enema may be given. When the rupture has involved the rectum, the bowels should not be disturbed for three or four days, after which a warm water enema may be given. When the rupture has involved the rectum, the bowels should not be disturbed for six or seven days, and the vagina should be washed out two or three times a day with warm water injections, deeply stained with Condy's fluid. Herman strongly advises the use of catgut sutures.

In rupture of long standing, various plastic operations are recommended, the edges of the rent being pared and brought together by sutures. The modifications of this operation are very numerous, and are outside the scope of the present work.

Tait's operation is the best. It is based upon the principle of removing no tissue, so that if failure should occur the patient is not left in a worst position. It is rapid, and gives excellent results. The recto-vaginal septum is split horizontally by curved, sharp-pointed scissors, and the edges of the perineal rent are also split up vertically by scissors, the edges being brought together by sutures, without transfixing the skin edges of the flaps.

Duke inserts the left index-finger deeply into the rectum, and with a long, straight, double-edged bistoury he pierces the tissues in front of the anus, guiding the knife as the septum is penetrated upwards for two and a half inches, the incision being enlarged laterally to two inches at least, as the knife is withdrawn. Sutures of silver wire are inserted by a needle bearing an eye in its point.

PERIOSTITIS.

Absolute rest of the affected limb, which should be elevated upon a pillow as the patient lies in bed, and in very mild cases following trivial injury, where the inflammatory action is circumscribed, the application of spirit lotion under oiled silk is all that is necessary to effect resolution. Where acute periostitis follows severe injury, or appears as a complication of syphilis or of any of the exanthemata occurring in weak patients, active treatment will be necessary to relieve pain and prevent the extension of the disease. Warm poultices or hot fomentations applied to the affected limb, if they afford relief, should be persisted in. If they fail, leeches should be applied, and bleeding encouraged by fomenting the bites afterwards. Should these measures fail to afford relief, one or two small incisions may be made through the periosteum down to the bone. This plan effectually prevents the injurious effects of prolonged high tension, and thus minimizes the after ill effects of the inflammation, and may prevent necrosis.

In severe cases it is a mistake to wait for signs of fluctuation when pain and tension are excessive. Strict antiseptic precautions should

be taken, and if pus is present the same treatment may be adopted, but the incision should be a bold and free one, and the knife should be felt to reach the hard bone beneath the inflamed periosteum.

After the incision, antiseptic poulticing should be continued. This may be simply carried out by dressing the wound with carbolic lotion (1 : 40), applied on lint, and covered with oiled silk, upon the top of which large deep pads of cotton wool may be secured by a light bandage.

Constitutional treatment will depend upon the severity of the case and the symptoms present. Where there is much fever, a simple diaphoretic, preceded by a brisk saline cathartic, as 1 ounce of Rochelle salt, is a good plan. Where syphilis exists, large doses of the iodide of potassium are most efficacious in relieving pain and cutting short the disease, and the older surgeons still employ calomel and opium in every case. The iodide often relieves the dull nocturnal pains in cases which are not specific, and there is generally no reason why it cannot have a trial in every case. The following is a good combination in the early stages. At a later stage the aconite may be omitted :

℞.—Potassii iodidi		gr. lxxx.
Tinct. aconiti		♏xx.
Liq. ammon. acet.		℥ij.
Syr. aurantii		℥jss.
Aquæ camph.	 ad	℥x.—M.

S.—Take a tablespoonful after meals, three times a day, and at bed-time.

Where the temperature runs high, large doses of the iodide, as a rule, are not well borne, and then a mixture containing 5 grains of antipyrine may be given every four hours. It often relieves the pain markedly. In the later stages iron and quinine and extra diet are essential.

In the very severe cases where the periosteal inflammation invades the entire length of a long bone, the serious symptoms which supervene rapidly may terminate fatally in a short time, unless prompt measures be taken to relieve the local and alleviate the constitutional disturbance. The first step in the treatment, as soon as the diagnosis warrants, is to make a series of deep and free incisions parallel with the shaft of the affected bone. These should pass through all the tissues and periosteum down to the bone, and may even be extended into the bone (linear osteotomy) by inserting a Hay's saw into the wound. This operation, which some surgeons recommend in chronic cases, may be followed by great reduction in the tension, but the incision should not be extended as deep as the medullary canal, and should not be made in the *very* early stage.

By these means acute diffused periostitis may be prevented from running into acute necrosis, and the shaft of the bone may be saved

and the patient's life rescued. The constitutional treatment will consist in absolute rest, a highly nutritious liquid diet, and large doses of quinine or cinchona preparations, with alcoholic stimulants. After the making of the incisions, warm antiseptic poultices should be applied every few hours, and as the progress of the case indicates the formation of new collections of pus, further incisions from time to time may be required. Where the death of the shaft occurs in spite of free and early incisions, and it becomes separated from its epiphyses, Clutton advises its removal by means of sub-periosteal resection before the formation of new bone.

Under Necrosis the subsequent management of those cases which have terminated in the formation of sequestra is detailed.

Chronic periostitis is generally syphilitic. It is to be treated upon the same general principles—rest, counter-irritants, and mercury with iodide of potassium in very large doses, and incisions when these measures fail. The writer has seen excellent results follow trephining in a chronic case which had resisted all measures. It is not unusual to come across patients suffering from chronic and painful periostitis or nodes, who have been taking mercury or iodides in a desultory way for years without benefit. Such cases generally yield rapidly to large doses of the iodide (20 to 30 or 40 grains), and full doses of mercury just short of salivation act like a charm after a course of the iodide.

Ostitis is to be treated upon the same lines in the early stage as periostitis—rest, leeching, poultices or fomentations, blisters and counter-irritants, and large doses of iodide of potassium. Where these fail, and the pain continues to wear out the patient, free incisions may be made with a stout scalpel through everything down to the bone, after which linear osteotomy may be performed by cutting through the shaft with a Hay's saw until the medullary canal is reached.

Where the pain is confined to a small circumscribed area, a piece of bone may be removed by trephining.

Syphilitic cases yield generally to 30 grain doses of iodide of potassium, and after the relief of the more urgent symptoms of pain and tension, a mercurial course must be commenced and steadily maintained.

PERITONITIS, Acute.

It is difficult to give any concise account of the treatment of a condition so varied as that which is known under the term peritonitis. At the bedside it is well for the student to discard the term altogether, and to only think of the disease as a *symptom* of another affection. This may not be strictly correct advice, as there may be such a thing as idiopathic peritonitis, but it is so rare that, given any ordinary case of inflammation of the peritoneum, it may with safety be regarded as secondary to inflammation of some other organ within the abdomen, to tubercle, septic poisoning, typhoid fever, perforation or rupture of a

hollow viscus, hernia, impactions, intussusceptions, injuries, hemorrhages, aneurisms, etc., or to inflammations or abscesses arising within the chest and extending through the diaphragm. (The writer has detailed and figured a rupture of the thoracic duct which produced a most interesting peritonitis. (See *British Medical Journal*, May, 1885,)

Thus it is obvious that the first step in the treatment of peritonitis is to find out the primary cause, and employ such measures and remedies as in the present state of our knowledge are best suited to the management of the primary lesion. These will be detailed under the different headings scattered through the present volume. It is lamentable to find a physician who, approaching a case with the idea that he has to overcome an idiopathic affection, continues to give opium and other anti-peritonitic remedies until a strangulated hernia is allowed to cut short a valuable life.

In the absence of such organic lesions as must be still regarded as beyond the reach of a cutting operation (and these are few), and where the cause is obscure, an attempt should be made to modify the inflammatory action by such measures as experience has proved to be often successful.

Rest is essential. The patient instinctively learns this himself, and lies in bed upon his back with the knees drawn up; but in mild cases, or in those treacherous varieties of peritonitis where little pain is experienced, the most absolute rest must be rigidly enforced. It may be necessary to protect the abdomen from the weight of the bedclothes by a cradle or other appliance.

Next in importance to rest is diet. Nature also dictates this in the majority of cases by causing the stomach to reject all solid nutriment, but often the patient may be tempted to partake of food which may lead to fatal results unless clearly warned by the physician. There is, perhaps, no other condition demanding greater care and judgment in the selection of food. As a rule, liquid nourishment alone is admissible; it should be given in very small quantities, and often. Less than a wineglassful of iced milk may be given every two hours mixed with a little lime-water or effervescing potash water, or half this amount may be given every hour.

In the case of children smaller quantities are necessary, and, as thirst is sometimes prominent, this rule will require enforcement. It is a matter of some moment that only the requisite amount of fluid should be handed to the patient on each occasion. A skilled nurse will not put to the lips of a thirsty and feverish patient more liquid than he is permitted to swallow at once. With young children it is a good plan to feed them with a spoon. Where milk cannot be tolerated, small quantities of beef-tea or beef-essence may be given, and ice in proportion to thirst and nausea. Ice is often abused, and strict directions should be given for its administration. The object of the physician is to administer only as much food as is necessary, and in such a way as to

prevent vomiting. Once this is started, it may be no easy matter to control it. If ice be swallowed in any quantity it melts in the stomach, and accumulates until vomiting is set up. Hence only small pieces should be given, and not too often, the object being that ice or milk in small quantities may be tempted to pass through the stomach before the arrival of the next dose.

Where vomiting is a prominent symptom, feeding by the stomach may be abandoned, and the rectum may then be washed out and made ready for nutrient enemata. A mixture of strong beef-tea and milk thickened with a little flour or gruel, and not exceeding 4 fluidounces, should be warmed, and just before use a dessertspoonful of Benger's liquor pancreaticus should be added. This may be gently thrown into the rectum every three or four hours.

At a later stage, in the absence of vomiting, other liquids may be permitted by the mouth, such as rennet, chicken soup, thin arrowroot, or other farinaceous foods. It is advisable to lay down the law that in the early stages of convalescence from peritonitis only such foods, or mixtures of foods, are admissible as will pass through the meshes of a fine sieve. Sifting is unnecessary, but this statement gives the nurse and patient's friends a clear idea of what is to be avoided—*i. e.*, the administration of anything containing even fine solid particles. In the later stages the amount of liquid nourishment needs no restriction.

Alcoholic stimulants may be required where collapse is present at the beginning, and in protracted cases, where debility and exhaustion are prominent features at the end of an attack. Champagne or good sparkling Hock may be useful in allaying nausea or preventing vomiting. Occasionally whiskey by the rectum may be necessary, when everything is rejected by the stomach.

Opium comes next in importance to rest and feeding. It is the one drug upon which reliance is to be placed, and it may in some cases be given in very large quantities. As a rule, the amount of pain present may be taken as a safe guide to the amount required. If the physician is satisfied that absorption is taking place, he may fearlessly administer opiates in desperate cases, regardless of any preconceived notions about dosage, taking as his guide the effect upon the pain present. To recklessly pour down opium, especially in the form of pills, without waiting to see by the symptoms of the case whether it is being absorbed, should be censured. The doses may accumulate, or the pills may pass through the stomach, and be all absorbed at once, and give rise to serious symptoms. A knowledge of the rate of absorption, and a little reflection upon the altered state of the digestive organs, will prevent this.

When there is no vomiting, and the pain is *very severe*, 45 or even 60 minims of tincture of opium may be given in a serious case; but it will be wiser to give two doses of 30 minims each, with an interval of one, two, three, or more hours between. The effect is to be kept up by

smaller doses at short intervals. The pilular form is, upon the whole, the best, owing to the risk of the liquid preparations being expelled by vomiting; but it is well to begin with the liquid, and keep up the effects by pills. Where pain continues to be excruciating, and the physician gets timorous about the absoption of the anodyne, he may give one dose by the mouth, another soon after by the rectum, and another hypodermically. In this way he need not fear accumulation. When prescribing opium in the pilular form in such cases it is a wise plan to prescribe some simple combination, in order to insure the pills being made up fresh.

One grain of opium in a pill has been prescribed by the writer, and pills had been dispensed which had evidently been made many months previously, and which would have furnished tolerably effective ammunition for rabbit shooting. He has known such to remain more than twenty-four hours in a *healthy* intestinal canal before the physiological effects of the drug commenced to show themselves. By writing a receipt for the following, which are not likely to be kept ready made, these objections are overcome:

℞.—Pulv. opii gr. j.
Ext. belladonnæ alcohol. gr. ¼.
Bismuthi oxidi gr. j.—M.

Make 24 such pills.

S.—Take one four times a day.

Where vomiting is incessant the writer prefers the modern elegant perule or pearl containing ⅛ or $\frac{1}{16}$ grain of morphine. Unlike the pill of crude or powdered opium, it does not appear to become insoluble; and as it is not larger than a millet-seed, it can be placed upon the tongue, and is almost beyond the risk of being ejected by vomiting. The weaker strengths are the best for general use, as any number may be easily administered at once. In renal disease and in very young children, opium must be used with the greatest care.

Mercury is still a favorite in the hands of some, and is supposed to exert an important influence over the inflammatory action. This is doubted by many, and the practice of salivating for peritonitis is fortunately a relict of the past, though calomel is often given in small doses in combination with opium. The experience of the writer has convinced him that in the early stages of acute peritonitis mercury is worse than useless. He had the opportunity some years ago of seeing the effects of small, oft-repeated doses, which appeared to seriously depress the patients and diminish their chances of recovery. In the later stages of the disease, however, when the violence of the inflammatory action has subsided, calomel in small doses is of the greatest service. Under its influence the tongue grows clean, and lymph and effused products rapidly become absorbed, and the bowels are probably brought sooner into a more natural condition.

Bloodletting is likewise becoming a practice of the past, and will doubtless become entirely so as the rarity of true idiopathic peritonitis is more generally recognized.

Leeching may be still resorted to in sthenic cases, and by its *early* use may relieve pain and tension, especially in cases where the inflammatory mischief is local, as in perityphlitis. A dozen leeches may be applied, and the writer has known fifty to be used in a case of general peritonitis. Where blood is to be extracted to this extent it would seem, however, much more rational to open a large vein and make a rapid impression upon the general circulation.

Saline purgatives have been much vaunted in acute peritonitis of late years, and numerous cases have been reported where very satisfactory results have followed their administration in the hands of surgeons. Meigs has ably explained this by showing that in surgical practice acute peritonitis is often anticipated after abdominal operations; and large doses of salines, administered at the very onset of the attack, may check the inflammatory action by directly depleting the abdominal and intestinal bloodvessels, through the production of large watery evacuations. The physician, as a rule does not meet with peritonitis in these very early stages.

When the disease has become established it is probable that the increased peristalsis would be a dangerous evil by interfering with the rest which is essential to the recovery of the inflamed intestinal peritoneum.

It is by quieting peristalsis and reducing the intestinal movements to a minimum that opium becomes of such very great value; and with our present knoweledge it is almost certain that the routine administration of purgatives would in many cases inevitably lead to fatal results, especially in cases of obstruction. Nevertheless, sometimes—especially when the intestinal tube is known to be patent—salines may be of great value, but their exhibition must be always a most critical experiment. Their introduction has, however, drawn attention to the fact that the dread of purgatives has led to the opposite extreme of locking up the bowels for long periods, to the detriment of the patient. From the result of several post-mortem examinations, the writer is inclined to believe that many patients die from want of a purgative, but this number would likely be a very small percentage of those who would succumb if the administration of purgatives became the rule and the use of opium the exception.

Where it is found necessary to increase peristalsis with the view of overcoming an obstruction in the bowel, a fair dose of castor oil is most decidedly the safest of all purgatives, but it is not the most efficacious. It may move the bowels and leave large impactions untouched, and it is, moreover, often rejected by the stomach.

Calomel in one large dose is then most efficacious, and 6 or 8 grains may be placed upon the tongue and allowed to find its way down into the stomach. Before its administration the physician must give the

most serious consideration to the symptoms and general condition of the patient.

Enemata of tepid water may at the same time be steadily persevered with. They should be given slowly and deliberately, and should contain no soap or irritant, the object being to get up as much fluid as possible without exciting peristalsis, while the patient lies upon his back with the pelvis raised. The use of the long tube, passed far up into the bowel, is, in the writer's opinion, a delusion, and much more likely to do harm than good. Meigs, who lays great stress upon the skill and judgment necessary in determining the exact moment at which a purgative should be administered in acute peritonitis, does not recommend either castor oil or salines, but advises the physician to feel his way with the following combination, which may be given every four hours unless violent pain is set up:

℞.—Ext. belladonnæ gr. $\frac{1}{12}$.
Ext. nucis vomicæ gr. $\frac{1}{4}$.
Pulv. ext. aloes gr. $\frac{1}{6}$.
Pulv. rhei rad. gr. $\frac{3}{4}$.—M.

Make twelve of such pills.

S.—Take one every four hours.

The *local* treatment of peritonitis is of some importance. As a rule, pain and distention are relieved by warm poultices applied every two, three, or four hours. At first, counter-irritation by means of mustard may be practised until the skin is well reddened, after which the continuous application of linseed-meal poultices may be proceeded with. Dr. Wales carries out this plan by means of a simple contrivance. A piece of thin flannel is laid upon a table, dry mustard is rubbed into this over an area as large as the required poultice, which is then spread upon the top of it, another piece of flannel is laid over the face of the linseed; there is thus obtained a poultice between two layers of flannel. The side containing the mustard is placed next the skin until smart counter-irritation is produced, when the poultice is simply reversed, the side corresponding to the plain linseed being then placed in contact with the skin and allowed to remain as long as the poultice keeps warm. A large piece of spongio-piline, wrung out of hot water, makes a good substitute for a poultice.

Cold applications sometimes afford more relief than poultices, and when this is the case, they may be safely used during the early stages. Leiter's tubes, cold compresses, bladders of ice, or iced cloths may be applied.

Various anodynes, as laudanum, belladonna, aconite, etc., may be tried alone or smeared over the face of the poultice. As a rule, they are little worth. Turpentine is a favorite counter-irritant used in the form of hot fomentation. Strong iodine or blisters may be indicated

at a later stage, when mercury internally is also beneficial, when it is desired to cause absorption of effused products.

When tympanitis becomes very distressing, a very fine trocar and canula or hollow needle may be used to puncture the intestine in several regions, with the object of permitting the escape of imprisoned air.

When peritonitis fails to yield to the above measures, and the diagnosis of an organic cause becomes certain, there is no use in further delay. Abdominal section, followed by irrigation and free drainage, may be the only chance of saving life.

Meigs states: "When called to *attend* a patient suffering with peritonitis we should first determine the cause, and if it is found to be an organic one the immediate use of the knife, followed by irrigation and drainage, is the only proper method of procedure. Should the cause be found to be functional, the use of purgatives, followed, if necessary, by enemata, is indicated; and these failing to relieve quickly, surgical methods should soon follow." The writer thinks this is too strongly put. (See the question considered at greater length under Intestinal Obstruction, page 419.)

Even in cases of acute suppurative peritonitis in the female following gonorrhœa, abdominal section with removal of the tubes, and even of the ovaries, flushing the abdominal cavity out with hot distilled water, and inserting a large drainage-tube, is a successful operation. It may be said that in nearly all cases of suppurative peritonitis the washing out of the peritoneum should be resorted to, in order to give the patient a chance for life, unless, under special circumstances, the condition can scarcely be made worse by such a procedure.

PERITONITIS, Chronic.

The treatment of the chronic affection is to be carried out upon the same lines as that of the acute affection, the chief point being to find out the cause and treat it. As a general rule, it may be said that the chief indication is to effect the absorption of lymph and effused fluid. Pain may require anodynes, but these should be used sparingly. Poultices, when pain is severe, may be employed, as in the acute variety, though counter-irritation is more likely to accomplish the desired end. Iodine is the best application. It may be tried in two different ways: the weak tincture may be painted on over the entire abdominal surface once or twice daily, either alone or mixed with a little weak spirit and glycerin, with the view of its becoming absorbed and finding its way into the lymphatics, or the strong liniment of iodine (1 : 8) may be brushed on daily as a smart counter-irritant until the skin begins to crack. The writer has obtained excellent results from the lin. potas. iod. cum sapone (B. P.) gently rubbed over the abdominal surface once a day and covered by a tightly fitting flannel bandage.

In strumous cases, the invaluable plan for the continuous application of cod-liver oil under a mackintosh binder has already been fully described (see page 507). This method is of the greatest possible benefit in some cases of chronic peritonitis.

Blisters may be useful. A series of small circular or square blisters may be applied over different parts of the abdomen for short periods (two or three hours), as in the treatment of pleuritis by flying blisters. In this way fibrino-serous fluid may be got rid of without resorting to surgical measures. At a later stage massage of the abdomen may be tried.

Internal treatment may be of use, and the selection of remedies must depend upon the primary cause of the peritonitis and upon the special or prominent symptoms present. As a rule, it may be said that cod-liver oil, iron, and iodides afford the best prospect of success.

Diuretics, purgatives, diaphoretics, and hot baths, with the view of causing removal of effused fluid, are usually worthless, though diuretin has been recently praised. Mercurials are seldom indicated. When they are, the best method of employing them is to smear a little diluted mercurial ointment over the cod-liver oil bandage under the mackintosh, and then apply moderate pressure by an outside calico binder.

When these measures fail to remove fluid, paracentesis may be resorted to. (See under Ascites.) Sometimes the primary affection may demand abdominal section, and the removal of chronically inflamed organs or uterine appendages, or the breaking down of adhesions.

Constitutional treatment in all cases is of the greatest importance. Nutritious food, pure air, change of scene, sea bathing, tonics, malt extracts, and peptonized preparations, are indicated in very chronic cases,

Constipation, tympanitis, vomiting, diarrhœa, and other complications are to be met by appropriate measures.

PERITONITIS, Perforative.

Absolute rest, ice to the abdomen, and the cessation of all feeding by the mouth, with opium in large quantities, have been formerly held to be the only available means of meeting this terrible condition, which, as a rule, ended fatally.

Now, such cases are regarded as instances of suppurative peritonitis, and treated often with complete success by making an abdominal incision, removing the contents of the stomach or intestines out of the peritoneal cavity, washing it by repeated and copious flushings of hot water until the fluid returns perfectly clear and odorless. The perforation should be closed by suture, and thorough drainage established. Some surgeons use very weak corrosive sublimate, boric acid, carbolic or salicylic solutions.

In this way, perforating ulcers of the stomach and intestines have been successfully dealt with, and several cases have been recorded

where the vermiform appendage has been the seat of perforation, and where incision of the abdomen has been carried out, and the appendix ligatured, the cavity thoroughly irrigated, and drainage established with complete success.

Abdominal incision in perforation of the bowel occurring in typhoid fever has been most unsatisfactory. Success is not to be expected in cases in which the perforation occurs while the fever is high or the disease in its active stage.

PERITONITIS, Tubercular.

The treatment of *acute* tubercular affection of the peritoneum will consist in the exhibition of those remedies which give some relief in acute tuberculosis, as large doses of quinine or antipyrine, to reduce the high fever generally present, together with the measures which experience has proved useful in the treatment of acute peritonitis as rest, poultices or warm fomentations, opium, liquid diet, ice, etc. The question of abdominal section in acute cases need hardly be discussed, because the diagnosis is uncertain in the early stages, and as the disease may be general, operative measures would be contra-indicated, and lastly, acute tubercular peritonitis is not often associated with purulent secretion in the abdominal cavity. Suppose, however, a case of acute tuberculosis limited to the peritoneum, and running into or causing suppurative peritonitis, could such a case be diagnosed with anything like certainty abdominal section and free washing out of the peritoneal cavity, with the establishing of free drainage, would be justifiable; and, notwithstanding the generally-accepted notions about the incurability of tuberculosis, such treatment might have been long since proved to be ultimately successful, after Spencer Wells' case, in which the patient was alive and well twenty-two years after the operation. (See below.)

The treatment of *chronic* tubercular peritonitis, formerly regarded as incurable, affords one of the most striking and brilliant examples of the success of modern abdominal surgery, and is almost certain to lead to far-reaching results in the management of tubercular affections generally.

For the relief of symptoms and general medical treatment little need be said, beyond reminding the reader that the management of a case of this disease will consist in the judicious exhibition of those remedial agents indicated in the treatment of chronic tuberculosis, along with the administration of remedies suitable for the relief of the accompanying peritonitis. The relief of pain, constipation, diarrhœa, hectic fever, and the prevention of debility and emaciation until the patient can be placed in a position in which there is some hope of his throwing off the tubercular disease by change to a more suitable climate, constituted the routine treatment until lately universally adopted. The great value of the cod-liver oil inunction, and its continuous ap-

plication by means of the binder and mackintosh, have already been referred to.

Abdominal section has been performed in some hundreds of cases with a success which could hardly have been anticipated. The abdomen has been incised, washed out thoroughly with warm water or weak antiseptic liquid, and drainage established where this was necessary. Ascites, as a rule, never occurs again, and hence, future tapping is unnecessary. Tait has had uniform success, as far as the operation was concerned, and a complete cure of the disease in 80 per cent. of all cases of tubercular peritonitis in which the abdomen was opened, cleaned, and drained.

The statements of Konig are hardly less surprising and inexplicable. He has collected 131 cases of peritoneal tuberculosis treated by abdominal section, of which 23 were greatly improved, 84 were cured (65 per cent.); of these, 30 exhibited no signs of intra-peritoneal tuberculosis for several years following abdominal section. In only 3 per cent. could death be attributed to the operation. A recent able writer reviewing these results, points out that as to the methods by which these cures were obtained, examination of the cases shows that there was only one condition common to all, that is, that the belly was freely opened and a certain amount of intra-peritoneal manipulation was practised. Even the free use of anti-bacterial agents appears in no way to improve the results.

PERITYPHLITIS AND TYPHLITIS.

The treatment of inflammation of the veriform appendix will be best conducted upon the same lines as that of acute peritonitis. Absolute rest in bed, lying upon the back with the legs drawn up so as to relax to the fullest extent the abdominal muscles, is the position to be enforced unless already instinctively selected by the patient. Hot fomentations or poultices should be applied at short intervals. Sometimes leeching gives great relief. Liquid nourishment in small quantities and often, especially beef tea or meat essences, and opium in full doses in proportion to the pain and constitutional disturbance, as in peritonitis, should be taken.

With this treatment in full operation, the physician closely watches events, avoiding the use of purgatives, and treating vomiting and other complications by appropriate remedies as they arise. Many, perhaps the majority of cases yield to these measures without further interference, and the bowel gradually begins to act in response to copious warm water enemata.

When signs and symptoms indicate the formation of matter the case assumes a serious aspect, but the physician should wait before hastily concluding that the abdomen requires opening, and watch events for a little longer.

The situation of the pus is of the utmost importance. If it be clear

that it is extra-peritoneal, hot poulticing will tend to hasten its approach to the surface, when a free incision will generally remove all immediate danger. Where the local signs point to a probable collection of pus, and the constitutional symptoms are running high, a hypodermic needle may be deeply inserted, and by injecting a few drops of weak carbolic solution the needle is cleared of all blood, and as the action of the piston is reversed, a few drops of pus may be obtained. In this case no harm can come of making a free, deep incision through skin, fascia, and muscle, down to the sac of the abscess, which should be washed out and a large drainage-tube inserted. In this operation the general cavity of the peritoneum is unopened.

It must, however, be kept prominently in mind that the so-called cases of perityphlitis do not often arise from accumulations or perforations occurring in the *cæcum*. The appendix vermiformis is the starting point in the great majority of cases, and accumulations, concretions, perforation, and gangrene of this troublesome appendage are, of course, much more liable to lead to dangerous and fatal peritoneal mischief, which can only be averted by prompt abdominal incision.

The situation then becomes most serious, and the physician whose faith in opium and rest is unlimited may allow the patient to pass beyond the reach of surgery before a laparotomy be decided upon.

The abdomen may be opened in advanced cases with fair prospects of recovery even after a general suppurative peritonitis has followed the perforation of the appendix, or the bursting of an abscess into the cavity. The mistake in these cases is generally made by the physician, who delays with drugs instead of calling in the assistance of the surgeon. Where there is no evidence of a general suppurative peritonitis, the best operation is that of opening the abdomen through the right linea semilunaris. This is advised by Langton, as it enables the surgeon to open the peritoneal cavity in the region of the iliac fossa without being too near to the appendix where adhesions are very liable to exist, and he prefers it to Gaston's operation in the linea alba.

It may, however, be a wiser plan to select the free median incision where there will be the probable necessity of flushing out the abdominal cavity with a weak warm antiseptic solution. In Langton's case reported in the *Medico-Chirurgical Transactions for* 1889, he found the appendix vermiformis gangrenous to the extent of two-thirds of its length with a solid concretion of feces at the line of demarcation. The appendix was ligatured, and the gangrenous portion removed, the abdominal cavity being well washed out with several quarts of sanitas water at a temperature of 100° F., a drainage-tube being inserted and iodoform dressings applied. Seventeen days afterward some suppurative peritonitis declared itself in the opposite side of the abdomen. The patient was again placed upon the table, and the abdominal cavity opened in the middle line, the peritoneum well washed out with warm water, and a Keith's drainage-tube inserted after the removal of a quantity of extremely fetid pus from the left iliac fossa. A rapid and

uninterrupted recovery followed. This brief sketch of a case where recovery followed two abdominal operations should convince the physician that where there is reason to suspect a perforation in the appendix, or a diffuse general suppurative peritonitis, the patient should not be denied the excellent chance which an abdominal section affords.

Few subjects have attracted more attention of late years than the treatment of inflammation of the appendix, and the view of early abdominal incision is rapidly gaining ground, especially as reports of successful operations are being published every week, where the conditions discovered upon opening the abdomen have been demonstrated to be incompatible with recovery.

Weir, in referring to the name perityphlitic abscess by which the condition is generally known, points out that all such abscesses originate in the peritoneal cavity, and there grow considerably before invading extra-peritoneal tissues, and that their cause is perforation of or a gangrenous condition of the appendix vermiformis, which as soon as a tumor can be felt should be opened by a lateral incision into the peritoneal cavity. He further insists that where no tumor can be felt, if the symptoms point to an increase of the local peritonitis and vomiting with increased abdominal resistance and higher temperature continuing for forty-eight hours, the danger of the disease is greater than that to be feared from the lateral or median abdominal operation which should then be immediately resorted to.

McBurney, who first pointed out the most important diagnostic point in connection with appendicitis, *i. e.*, the invariable presence of a minute point of exquisite tenderness almost exactly two inches from the anterior iliac spine on a line drawn from this process through the umbilicus, thus describes the preliminary steps of the operation: "The incision should be a liberal one, for much room may be required, and a five-inch cut in the adult is not too much. It should follow as nearly as possible the right edge of the rectus muscle, and the centre of the incision should lie opposite to or a little below the anterior iliac spine, on a line drawn to the umbilicus. When the external oblique aponeurosis is cut through by this incision the aponeurotic structure in which the other abdominal muscles end comes into view, and is easily divided without cutting muscular fibre. Then the fascia transversalis, the subperitoneal fat, and the peritoneum are cut in succession. On opening the peritoneum the appendix may at once be seen, or adhesions and inflammatory exudation may have so distorted the parts that a careful and difficult search may be required to find the appendix at all." The subsequent steps of the operation will vary in every case as no two are alike, but the appendix should, if possible, be separated from surrounding structures, tied with silk or catgut close to the cæcum and cut away. The stump will then require careful scraping and disinfection, and the entire neighborhood must be well treated with bichloride solution, a drain inserted, and the small space packed with iodoform gauze.

Some surgeons, after the operation, resort to saline purgatives to

prevent further peritoneal inflammation, and to avoid the adhesions which are liable to occur during the period of paralysis of the bowel.

The same serious consideration must be given to the exhibition of purgatives during the later stages, as has been already referred to under Acute Peritonitis. The physician may, however, resort to warm water enemata first, and afterward to a small dose of castor oil. The old method of giving large quantities of metallic mercury to cause mechanical evacuation of the bowel is *very* dangerous and unjustifiable. In the convalescent stage, laxatives, tonics, good feeding, and change of air, with other restoratives, will be indicated.

PERSPIRATION, Excessive.

Under Phthisis, the various remedies for the profuse perspiration which accompanies the septic stages of that disease will be discussed. In the great majority of other cases where excessive perspiration is present it will be found to be secondary to some other affection which requires treatment, as chronic alcoholism, acute rheumatism, ague, etc.

In those comparatively rare cases where hyper-secretion of the sweat-glands occurs, independent of any other affection, some abnormal condition of the vasomotor nerve supply is probably present and may require treatment. The clothing should be light and absorbent, thin flannels being the best fabric for wear next the skin.

The skin should be bathed in very hot water to which vinegar is added in cases where there is no elevation of cutaneous temperature, and smart friction is afterward to be employed. Unna then advises an ointment containing ichthyol and turpentine to be rubbed in before bed-time. This is to be washed off in the morning, very cold water is to be used and thorough friction, after which a powder containing mustard is to be dusted over the skin. In cases where the skin is warm he advises the use of the ichthyol ointment or soap.

Some authorities recommend the inunction of the entire body with sweet or neat's-foot oil. Of internal methods of treatment, the writer believes that a very dry diet with the least amount of fluids will give the best results.

Atropine, $\frac{1}{200}$ to $\frac{1}{100}$ grain, three times a day, alone, or with 15 to 30 minims of the fluid extract of ergot, may be tried. Sulphuric acid, tannin, quinine, strychnine, agaric, minute doses of pilocarpine, sulphate or oxide of zinc, and nearly every remedy found useful in diminishing the night sweating of phthisis have been used, but their effects are very transient.

A 5 grain tabloid of sulphonal, twice or three times a day, is a very good remedy where the perspiration is general.

Arsenic and iron in combination with nux vomica may be tried, and the continuous current is sometimes useful.

It is, however, generally in cases of local hyperidrosis, accompanied by an unpleasant odor in the perspiration, that the physician is con-

sulted. This affects most commonly the feet and toes or the armpits and groins. In feet cases the affection is sometimes so severe as to make the victim a nuisance to others, and relief is most desirable. The internal remedial agents may be tried, but the writer seldom employs them at all, as local treatment will give excellent results in the great majority of cases when the patient can be got to carry it out thoroughly.

This affection, which is dignified by the name of osmidrosis or bromidrosis, can only be removed by the most absolute cleanliness. The stockings or socks should be changed at least once a day, and in bad cases oftener. The writer advises these, after washing in warm and cold water, to be dipped in a strong or saturated solution of boric acid, and allowed to dry. This makes a boric gauze. They should be manufactured from very thin fine-spun wool or a mixture of wool and cotton. The feet being bathed morning and night in tepid or cold water, and briskly rubbed with a coarse towel, which should be carefully passed between the toes, should then be thoroughly dusted over with the finely powdered boric acid, and the stockings drawn gently over them. This plan will often enable the owners of tender, perspiring feet to pass the summer walking exercises in comfort.

In the German army a weak solution of chromic acid is used for this purpose. The writer gave this method a fair trial, but abandoned it in favor of the safer and more efficacious boric acid. The boric acid may also be used in the form of an ointment (1 part to 3 of lard), and this may be freely smeared over the feet. It is better than the powder for the armpits, but it destroys the clothing.

Hebra employed daily for several weeks a firm diachylon ointment, consisting of equal parts of linseed oil and lead plaster, or of the formula on page 81, spread upon pieces of linen sufficient to cover each foot, smaller pieces being placed between the toes. A bandage being applied, the stockings and boots were afterward worn over the ointment.

Salicylic acid, oleate or oxide of zinc, talc, Fuller's earth, naphthol, bismuth, rice powder, and other powders are used.

Bardet uses the powder mentioned upon page 81, after washing with alcohol, or else the following: Rice powder, 60; subnitrate of bismuth, 25; permanganate of potassium, 10; talc, 5.

Shoemaker uses powdered oleate of zinc 3 parts, and powdered starch 4 parts, or equal parts of salicylic acid and subnitrate of bismuth, or naphthol 1 part, and powdered boric acid 12 parts.

Antiseptic ointments of all kinds, as well as lotions containing corrosive sublimate, carbolic acid, creasote, tannin, lead, zinc, alum, and other astringents, are also recommended; but the writer prefers the boric acid to all other methods. (See also under Bromidrosis, page 80.)

PERTUSSIS.

As soon as an attack of severe whooping-cough is declared, the physician may lay his plans for a long siege, in which he may feel confident that if the little patient's strength be maintained, and the various possible complications warded off, the enemy is bound to capitulate at the end of six or eight weeks. Remedies administered with the view of cutting short the attack at the beginning fail, and the treatment should from the first be directed to those measures which will place the patient in the best position for withstanding the long drain upon his strength.

Isolation is the first question to be settled. This is to be decided upon the peculiar nature of the patient's surroundings, and, as it generally will be required for eight or ten weeks under ordinary circumstances, there is no use in beginning a system of isolation in a half-hearted way, nor is there any use of insisting upon it where it is almost certain to break down in a few weeks. Moreover, no plan of isolation should be accepted which will confine the patient to one room during the entire illness. As a rule, in this country the patient's parents, who generally know a good deal beforehand about such a common disease, refuse to carry out a system of rigid isolation. The writer's practice is to warn the patient's relatives of the danger which might arise if some weakly member of the family were to catch the contagion, and to urge upon them the advisability of placing several rooms in the house at the disposal of the invalid, and advise that the others should be sent away.

The child should have large, well-ventilated sleeping and play rooms, especially in the winter-time, and at all times when possible. This is a matter of more importance than nurses, and parents can be made to see. As will be mentioned later on, disinfection being necessary during, as well as at, the termination of the illness, everything capable of being injured by the fumes of burning sulphur should be removed.

The next point to be settled is the one of permitting the child to go out-doors. Moderately strong children, even in smart attacks, not only are safe, but are much better for being out all through the attack. Plenty of fresh air is really of more importance than medicine in a long illness like whooping-cough. Of course, in severe weather, with rain and cold, or during the prevalence of the spring east winds, or in the presence of any bronchial complications, out-door exercise must be forbidden.

Diet is of great importance, and, in the management of weakly young children, will turn the scale for or against recovery. The usual diet which experience has proved to agree best with the child is to be continued, provided it be wholesome and highly nutritious. A mixed and varied diet does best with grown-up children.

After the paroxysms have become thoroughly established and the appetite begins to fail, the patient must be coaxed to take milk or other nutritious fluid nourishment between meal-times.

After a time, when the paroxysms are attended by vomiting, the critical period in the dieting arrives. The nurse should be directed to withhold food for a short time in the presence of a threatening or expected attack of coughing, and to aim at having the child fed as soon as possible after an attack, so as to permit the food to be as long as possible in the stomach before the next turn of vomiting. By carefully attending to this hint, lives may be saved.

Hard, indigestible food in the stomach, as nuts, green fruits, unripe apples, etc., will increase the laryngeal spasm, and portions of unchewed beef and potatoes may give serious trouble during the act of vomiting. Hence, upon the whole, a liquid diet is to be preferred for small children, or the ingredients should be carefully comminuted.

Clothing should be warm, and so arranged as to prevent overheating at one time and chills at another, an even temperature and the avoidance of draughts being desirable. Light flannel underclothing is essential, except in very warm summer weather.

During the paroxysms young children should be lifted on to the nurse's knee or lap, and every constriction about the neck or chest should be removed. Naegele states that the paroxysms may be arrested by simply pulling the lower jaw downward and forward, and this is effective also during sleep.

As regards drugs, the list is a long and tedious one to discuss. Most physicians find themselves after a time settling down to the routine employment of one or two simple expectorant agents. Active or heroic medication is to be condemned. Since the improvements in our knowledge of bacilli and the part played by them in various infectious diseases, many germicides have been tried in the treatment of whooping-cough, but to none of these can a specific action be fairly attributed. The plan of treating the disease by inhalations can hardly be said to have proved a success, though antiseptics of a volatile and unirritating nature certainly appear to modify and sometimes to shorten the duration of the disease.

Carbolic acid in the form of a spray (1 : 100) may be inhaled by the patient three or four times a day, or a stronger spray be diffused frequently through the air of the room. The plan of forcing young children to submit to such solutions being sprayed directly into the mouth is not to be recommended. They often increase the frequency and severity of the paroxysms.

No objection can be made to the air of the sick-room being impregnated with a volatile antiseptic like turpentine poured over the surface of hot water. Terebene, eucalyptus oil, peroxide of hydrogen, etc., may be similarly used, and they are of the greatest benefit where several children are confined in one room in severe weather.

Oil of eucalyptus has been praised as an inhalation and as a spray, and even when given internally. Hardwicke mixes it with turpentine and spirit as a spray, while he gives the turpentine internally at the same time.

The following spray may be diffused through the room several times a day:

℞.—Olei eucalypti ℥ij.
Olei terebinthinæ ℥j.
Thymol ℥j.
Spt. lavandulæ ad ℥vj.—M.

S.—To be used as directed.

Less can be said for the methods suggested for cutting short the disease by the application of various solutions to the fauces or larynx, the most recent being that of applying a 5 to 15 per cent. solution of cocaine with a brush to the pharynx and larynx (some recommend this in a spray), and resorcin, 2 per cent., afterward. These strong solutions of cocaine, either when painted, swabbed over the throat, or sprayed into the mouth, are certainly dangerous, and if used at all with very young children great caution should be employed to prevent any quantity of the solution being swallowed.

Resorcin spray, 2 per cent., is safer, and very glowing reports of its use are published.

W. B. Richardson has recently extolled the peroxide of hydrogen as an inhalation and internally.

Strong solutions of caustic or nitrate of silver are still painted over the fauces by some.

Solutions of quinine, salicylic acid, nitrate of silver, corrosive sublimate (1 : 10,000) have been injected into the nose, and benzoic acid or benzoin, quinine, iodoform, boric acid, tannin, bicarbonate of soda, alum, pulverized marble, have been used as insufflations.

Bartholow uses for insufflation a powder consisting of 1½ drachms of salicylate of bismuth and powdered benzoin and 18 grains of quinine.

An ointment of 1 part of eucalyptol, 1 part of iodoform, and 16 parts of vaseline, is a well-known nasal application.

Upon the whole, the reports of these methods from impartial observers are not satisfactory, and the writer cannot speak from personal experience.

As regards internal remedies, the difficulty perhaps would be in finding any considerable number of well-known drugs which have not at some time or other been pressed into the service as specifics for whooping-cough. Only a comparatively small number of the so-called specifics can be mentioned.

Given an ordinary case of pertussis in the early or catarrhal stage, the diagnosis, of course, will be at first somewhat doubtful, unless other children are suffering from the affection in the same house. The writer's plan is to order a simple expectorant like the following and await events. For a child seven years old the following may be prescribed:

℞.—Vini ipecacuanhæ ℥v.
Spt. ammon. aromat. ℥iij.
Tinct. scillæ ℥ij.
Tinct. opii camph. ℥iv
Syr. tolu. ℥jss.
Aquæ camph. ad ℥iv.—M.

S.—A teaspoonful to be taken four times a day in a little water.

In mild cases of the disease this mixture may be continued all through, but as a rule, when the crowing begins it will be beneficial to substitute 3 or 4 drachms of the bromide of ammonium for the tincture of squill.

Such simple treatment will do something to ward off chest complications, as the administration of ipecacuanha appears to exert some influence in preventing further catarrhal trouble if the patient is permitted to run about in the open air. The medicine should be given soon after meals. The oxymel of squill alone may be often employed, instead of the above mixture, with advantage.

When the paroxysms become severe and frequent, say up to twenty or more in a day, and when their intensity begins to tell upon the patient's strength, several drugs have a claim upon the physician's attention after bromides fail. These are chloral, morphine, belladonna, antipyrine, conium, quinine. The writer names them in the order in which they will, in his opinion, be likely to give most satisfactory results.

Chloral certainly possesses marked power over the spasmodic element in the disease. The usual rule for dosage is 1 grain for each year of the child's age, but it is better to give half this amount, and more frequently, say every two hours, and even then a still smaller dose may do. It should, however, be always remembered that chloral is a dangerous drug in the presence of cardiac weakness, and in complicated cases it must be used with caution.

Morphine also is anything but a harmless drug to administer to very young children, especially when there is profuse bronchial secretion. The physician can, however, discreetly feel his way with it. Henoch, whose experience is great, prefers it very much to all other narcotics, and he says, speaking of the remedies used in allaying the spasms of whooping-cough: "I have now come to put trust only in one, namely, morphine, which is far more efficacious than the much-used belladonna —at any rate, in relieving the violent attacks, especially those occurring during the night, and in diminishing their frequency." It may be used alone, in conjunction with the expectorant combination mentioned upon the previous page, or along with belladonna, antipyrine, or chloral. With this latter drug it goes well, and when both are given together less of each is required, and greater safety obtained.

Henoch's formula is the following:

℞.—Morphinæ acet. vel hydrochlor. gr. $\frac{1}{8}$ to gr. $\frac{1}{2}$.
Syr. simplicis ℥ss.
Aquæ ad ℥jss.—M.

S.—A teaspoonful twice to four times daily.

He does not state for what age this is suitable, but it may be given in the weaker strength to a child two or three years old. When drowsiness supervenes, the nurse should be directed to suspend the medicine.

Belladonna or atropine is a favorite remedy with many for the spasmodic seizures, but it must not be forgotten that, to be of any practical use for this purpose, it must be given in doses bordering upon dangerous. The physiological effect of the drug must be obtained, and, since this varies considerably with the dose of the different preparations, atropine should be selected, and its effects closely watched. A child three years old may receive 1 minim of the solution of atropine (1 : 100) every three or four hours until the pupil dilates, or 8 minims of the tincture of belladonna may be given instead. The extract is only to be used when the pilular form is selected. This is unsuitable for children, and there is serious danger of the powerful alcoholic extract being dispensed when the green extract is intended.

When the physiological action of the drug has been obtained, smaller doses are then necessary to keep up the effect. Children bear the drug very well, much better than adults. The above doses may be given every hour for many times without producing any effects beyond relief to the paroxysmal attacks. Sometimes it fails completely, and where serious complications exist it should not be administered. The first evidence of delirium should warn the patient's friends or nurse to stop the medicine. Though this practice has had the sanction of the very highest authority, the writer has ceased to use it because of its danger and the amount of anxiety which attends the treatment of a case of whooping-cough by a remedy so powerful. It appears to act best and to require smaller doses when the disease reaches the end of the third week. This remedy may be safely combined with chloral or with morphine advantageously.

Antipyrine has been tried with varying successes, and the reports are contradictory, chiefly because the first statements were so roseate, and subsequent observers tried the drug, expecting results which were not fulfilled. Nevertheless, it is clear that this agent possesses some influence over the severity of the paroxysms and the duration of the disease. It is best given alone, and a child one year old may get 1 grain every four hours. The writer has given twice this amount to a child under one year. It may be given in solution in water well sweetened with syrup of tolu.

The usual diaphoretics or diuretics, as spirit of nitrous ether, sal volatile, etc., should not be ordered in combination with antipyrine. It acts best when given in the early stages of the disease. Sonnenberger

recommends three or four doses in the twenty-four hours, consisting of as many decigrammes (1½ grains), as the child counts years, or as many centigrammes (⅛ grain) as the child counts months. With these doses the cough is diminished, the paroxysms become less frequent, and the duration of the affection is lessened.

Antifebrin, in proportionately smaller doses, has similar action, but does not appear to be so safe or uniform in its effects.

Phenacetin has been used in the same way, but upon the whole, its action appears to be less uniform and satisfactory, and it does not possess any advantages over antipyrine. The dose should be about one-third the dose of antipyrine.

Heimann reports excellent results, but some other observers have stated that it was of no use whatever. Upon the whole, the treatment of this disease by means of the new analgesics is steadily losing ground.

Conium has been often employed, and appears to modify the severity of the paroxysms when other measures have failed, but it is the least reliable of the remedies already mentioned, and is useless in all cases, unless, like belladonna, it be given in doses capable of producing its physiological effects. The fresh juice is the only reliable preparation, and of this large doses may be safely given. Ringer gave nearly 1 ounce every hour to a choreic child. For a child three years old, 30 minims may be given, and repeated every one or two hours until the physiological effects of the drug are beginning to show themselves. Upon the whole, the uncertainty of its action and the anxiety to the physician of giving a drug in such doses as cause ptosis and difficulty in swallowing, are not qualities to commend it, unless every other remedy has failed.

Quinine is vaunted by many as almost a specific in whooping-cough. Its bitter taste is an almost insurmountable barrier to its internal administration to children, and the writer has ceased to employ it on this account, except in cases where there is a high temperature, and where the previously mentioned remedies have failed. It has, moreover, another objection which appears not to have been noticed by those who recommend it—*i. e.*, it tends to dry up the secretion of the bronchial tubes, and in this way it increases the difficulties of expectoration, and hence it should be very cautiously given where there is much bronchial catarrh.

Fervers recommends the hypodermic injection of the carbamide of quinine. Sometimes, however, the seat of injection becomes irritated, and an abscess forms after the use of this urea salt of quinine.

The sulphate, muriate, or tannate may be given by the rectum in two full daily doses. A child three years old may get 4 or 5 grains in this way in the twenty-four hours if the paroxysms are very frequent and severe. These doses appear to diminish reflex excitability.

Rothe uses a solution of iodized phenol for internal administration. The following is a modification of his formula:

℞.—Acid. carbolici purif. gr. xv.
Spt. chlorof. ♏xv.
Tinct. belladonnæ ♏xxx.
Tinct. iodi ♏x.
Syr. et aquæ ad ℥ij.—M.

Of this he gives a teaspoonful every two hours to children between two and twelve years. Of carbolic acid the dose seems a large one, and of belladonna the amount is too small to be of any use whatever. There is no noubt that small doses of carbolic acid are useful. One minim of the glycerin may be given every three hours to a child two or three years old.

Rachel recommends the administration of 5 minims every two hours of a 2 per cent. solution of chloride of gold and sodium.

W. B. Richardson advocates the administration of peroxide of hydrogen in the form of ozonic ether, and states that he knows of nothing so near to a specific for whooping-cough.

Cocaine, in small doses, has sometimes appeared to give good results.

Alum, in doses of 2 grains for a child three years old, may be given every three or four hours, and is a favorite remedy with some.

Chloride of ammonium may be given in the same way, or in combination with alum or the bromides.

The oxide of zinc is an old-fashioned remedy, and the writer has seen it do well in mild cases. A child two years old may get ½ grain.

Sulphate of zinc is also used in the same way in doses bordering upon nauseating.

Ouabaïne, a crystalline alkaloid obtained from an arrow poison, has been used by Gemmell in forty-nine cases of whooping-cough in all stages, and he reports most favorably of its value in cutting short the attack if given early, or of diminishing the number of whoops if given in the later stages. It may be given dissolved in water, the dose for a child under twelve months being $\frac{1}{2000}$ grain every three hours. Double this dose, *i. e.*, $\frac{1}{1000}$ grain, may be given to a child three years old.

Chloroform or ether may be occasionally employed as inhalations to the extent of producing mild anæsthesia where the severity and frequency of the paroxysms appear liable to end fatally by preventing sleep or feeding. They will be very rarely necessary, and can, of course, only be used at long intervals, and then only for a few minutes.

Chloroform has been used by adding a few drops (two for every year of the child's age) to warm water in any ordinary inhaler, and breathing the vapor four times a day.

Nitrite of amyl is sometimes of use in such cases, and hyoscine has even been recommended.

Bromoform has been recently praised by Senator and others. They give 2 or 3 drops thrice daily mixed in water to a child one year old,

and it is claimed by Löwenthal that this drug makes an impression upon the disease after a few days' administration.

Andeer publishes surprising results from the administration of small quantities of resorcin.

Cannabis indica has been used where opium or chloral cannot be given, and where a narcotic is indicated.

Ergot is still vaunted as a specific, but it possesses no action over the disease.

Senega, lobelia, checken, grindelia, clover, tartar emetic, terebene, turpentine, and other expectorants, are still supposed to act beneficially and sometimes specifically upon the paroxysms.

Hydrocyanic acid is occasionally very useful in relieving cough and spasm.

Gelsemium, though a dangerous drug for very young children, is sometimes recommended where the spasmodic element is unusually well marked.

Valerian, asafœtida, camphor, ergot, musk, and sumbul, are also recommended in these cases, and there are still those who believe in the internal administration of the dilute nitric acid.

A blister to the nape of the neck sometimes seems to lessen the amount of spasm, and leeches applied to the same region, or to the larynx, have been recommended, as have also been Leiter's tubes and iced compresses.

In the later stages of the disease there is nothing so valuable as a change of air, and the old plan of bringing children to the gas works, and allowing them to breathe the fumes of gas-lime has been often found to lead to rapid improvement. Various plans have been devised to carry out some treatment upon the same principle at home, without exposing the children to the vicissitudes of weather. The various inhalations already mentioned have been employed with this intention, and the odor of coal gas, of sulphuretted hydrogen or sulphurated potassium solutions have been recommended. Of all such measures, however, the plan of sulphurous acid fumigation, as carried out by Mohn, is by far the best. The writer has seen excellent results from it in the later stages of the disease, and he believes it should always be employed occasionally during the middle and several times toward the end of the treatment of every case of whooping-cough.

The plan consists in removing the patient from his sleeping-room in the morning, after which sulphur is freely burned in the room (6½ drachms per cubic metre of air space), with the door and windows closely shut, for at least five hours. After opening all outlets and inlets, and ventilating the room until the air can be safely breathed, the patient, with clean linen garments, is to be brought back in the evening and put to bed, and Mohn maintains that he awakes cured next morning. Certainly, sometimes the paroxysms appear to rapidly diminish after this procedure.

In the convalescent stage remedies which improve nutrition may be

given. Cod-liver oil and syrup of iodide of iron are the best of these. Arsenic in small doses is of use when convalescence is protracted, and counter-irritation by means of stimulating liniments to the chest is useful in all stages of the affection. A favorite external application is the oil of amber, which is also given internally; but the most valuable liniment is, in the writer's opinion, the oil of eucalyptus which may be applied alone or with an equal quantity of olive oil or spirits of camphor. By this means, if freely used, the patient often breathes for a short time in the day and at bed-time a purified atmosphere.

The following application may be used:

R.—Olei eucalypti ʒ i
Lin. camph. ʒ i
Olei cajuputi ʒ ss
Olei menthæ pip. ʒ ss–i
S.—To be used as directed.

PETIT MAL—See under Epilepsy.

PHAGEDÆNA—See under Gangrene (Hospital).

PHARYNGITIS, Acute.

The treatment in severe cases will consist in a smart saline purge, and the administration of any simple diaphoretic mixture, as:

R.—Liq. ammon. acet. ʒ ii
Spt. æther. nitros. ʒ ss
Tinct. veratri vir. ♏ xv
Aquæ camphoræ ad ʒ viij–iss
S.—One tablespoonful to be taken every second hour.

To the throat may be applied a weak solution of carbolic acid, with or without cocaine, either in the form of gargle or spray, as:

R.—Acidi carbolici . . . ♏ x
Cocaine hydrochlor. gr. viij
Pulv. sodii bor. ʒ ij
Aquæ rosæ . ad ʒ viij–iss

This makes an efficacious gargle, and it can be painted frequently or sprayed over the inflamed membrane when there is any difficulty in using a gargle. It is also a good remedy in those cases where the larynx has become affected, as shown by hoarseness and pain in speaking, as well as in swallowing. In such cases, as a rule, steaming the throat by holding the face over a large basin of boiling water and covering the patient's head and shoulders with a sheet is very soothing and helps to cut short the attack.

At a later stage or in mild cases from the first an astringent gargle, such as is useful in chronic cases, may be very beneficial. Salol has recently given good results in acute pharyngitis. It is, however, more clearly indicated, and will give more satisfactory relief in acute tonsillitis.

Chronic catarrhal pharyngitis "or relaxed sore-throat," may be a very troublesome complaint, though not associated in any way with any danger to life. The first step in the treatment will be to remove the cause when this is evident. Two common factors, if not removed, will often render all treatment useless. These are excessive indulgence in tobacco and alcohol. Chronic dyspepsia and gout are also causes requiring attention, and the affection is most frequent in those following indoor sedentary occupations associated with late hours and bad ventilation.

Tonics and measures which improve the general health, as iron, quinine, cod-liver oil, good food, pure fresh air, a prolonged holiday, or what is of the greatest importance to the hard-worked city slave, is to insist upon his sleeping outside the smoke and dust of the town in a seaside or rural suburb.

The efforts of continual hawking or clearing the throat, especially in the morning, tend to greatly aggravate the mischief, and these should be suppressed as much as possible by the patient. A course of bromide of potassium has a very marked influence in diminishing the sensibility of the pharyngeal membrane, but a simpler method by far, and one not associated with any depressing effects, is to apply a weak carbolic solution to the parts.

This may be accomplished by using the carbolic gargle or spray, mentioned upon the previous page, for a few minutes every morning, The same effect can be produced during the day by sucking a carbolic acid lozenge. Not only is the sensibility of the pharynx lessened by this plan, but the palatal muscles are partially paralyzed, and the incessant efforts at swallowing are arrested and the irritated membrane is put in a state of comparative rest. Sometimes in severe cases the glycerin of carbolic acid (1 : 4), diluted with twice its bulk of glycerin or water, may be brushed over the pharyngeal mucous membrane with a large camel's-hair pencil.

After the irritation has been somewhat diminished, astringent applications should be constantly made to the chronically inflamed membrane. The glycerin of tannin (1 : 4) is a favorite remedy painted on with a brush night and morning, but it very often fails to produce any benefit. The glycerin of alum (1 : 5) is better. Tannin dissolved in ether is said to be much more valuable than the glycerin preparation.

Chloride of zinc, 15 grains to 1 ounce of water, and nitrate of silver, 15 to 30 grains to 1 ounce, are both useful for local application. They can be used in the form of spray if made of half this strength.

Chloride of ammonium, chlorate of potassium, alum, sulphate of zinc, bicarbonate of sodium, chloride of sodium, are used as gargles 10

grains to 1 ounce, or as sprays, or swabbed on with a small mop of lint or a large brush.

The writer's favorite gargle is the following:

℞.—Acidi carbolici ʒj.
Acidi tannici ʒij.
Glycerini purif. ʒj.
Tinct. capsici ʒj.
Infusi rosæ acidi ad ℥xij.—M.

S.—To be used frequently.

This solution can be mixed with water at first in equal proportions ond the amount of dilution can be gradually lessened until the gargle is used in its full strength. It may likewise be used as a swab or spray.

The excellent tabloids consisting of borax, chlorate of potassium, and cocaine, are most elegant and efficacious if slowly sucked in the mouth and the saliva swallowed. The tincture of iodine and glycerin, in equal quantities, is a valuable local alterative when swabbed over the pharyngeal membrane. Recently the writer has obtained excellent results from a mixture of 1 part of the tincture iodine and 7 of the glycerin of alum (1 : 5), painted on morning and night. Trichloracetic acid, as recommended by Stein and as described under next article, may be used.

PHARYNGITIS, Granular.

The same advice regarding the treatment of causation must be followed out as in the case of simple chronic pharyngitis. Little progress need be expected until the patient changes his mode of life very considerably. The writer attaches great importance to the patient leaving city sedentary life and living in a suburban, country, or seaside place. In the case of public speakers, who are subjects of granular pharyngitis, a certain amount of laryngeal trouble always follows any special effort, and the most thorough rest of the affected parts that can be possibly obtained should be insisted upon until the treatment is well started.

A long sea voyage often succeeds after the failure of every known drug; singing, loud speaking, smoking, and over-indulgence in alcoholic stimulants, and rich, high-seasoned dishes being forbidden. In ordinary cases sea-bathing is of service, and a tricycle ride of several miles along the coast afterward, if the weather permits, is of great benefit.

While every known means of improving the general health is to be persisted in, the internal administration of drugs is of little moment, except in so far as it assists general building up of constitutional vigor. Iron may be given alone, or in combination with quinine, arsenic, phosphorus, iodine, or cod-liver oil.

Free purgation, by means of any of the natural mineral waters, or a sojourn at Carlsbad or Harrogate, may be beneficial.

Local treatment is always of the greatest importance. This is to be carried out upon the same lines as in treating chronic pharyngitis, soothing carbolic lotions or sprays being employed where there is much local pain or irritation. Any of the astringent gargles, sprays, or swabs may be tried, but, as a rule, little may be expected from these measures in very chronic cases associated with much hypertrophy or numerous granulations. These must be destroyed if a radical and permanent improvement is to be aimed at. In the great majority of cases a cure from internal medication and local astringents need not be expected.

Nitrate of silver fused upon the end of a strong silver probe may be employed to destroy the granulations, only a few being operated upon at each sitting. A strong solution of the nitrate (1 drachm to 1 ounce of distilled water) is a favorite means of carrying out this object; but it is a mistake to paint over any considerable area of the pharynx with this at one sitting, owing to the irritation which may ensue, unless much ulceration is present. Every second or third day is often enough, and the carbolic lozenge or spray may be frequently used before and after each application. Cocaine may be employed to lessen the pain and irritation. Where the solid stick or strong solution fails, the granulations may be separately destroyed by the galvano-cautery after swabbing of the throat with cocaine solution (10 per cent.). Lawrence sometimes uses "London paste" for the destruction of the granules, but Butlin scrapes them with a Meyer's ring knife.

Rualt's method of "grattage" is reported as being very successful. The pharynx is painted with cocaine; a hard brush with the hairs cut short is dipped into a 10 per cent. solution of iodine and iodide of potassium in water, and the mucous membrane is vigorously rubbed with this until bleeding occurs. After this has subsided a softer brush is used. At the end of about five days, when the inflammation has subsided, the operation is repeated once, and these two sittings are reported to effect a cure.

Recently Ehrman has obtained results in chronic pharyngitis which far outstrip those produced by any other drug or methods of treatment. He employs pure crystallized trichloracetic acid by means of a probe and cotton wool. This effective caustic (author's *Pharmacy, Materia Medica, and Therapeutics*, fifth edition, page 528) destroys all diseased membrane without producing any pain or inflammation if cocaine be used previously. It can be applied to the nose and behind the palate. A solution (1 : 3) in glycerin may be freely painted or swabbed over the granular surface.

At a later stage the chloride of zinc solution (15 to 20 grains to 1 ounce) may be freely applied after local irritation has been soothed by any of the gargles, or sprays, or swabs already mentioned. As a

rule, however, it may be said that the gargle is the least satisfactory of all the forms of local applications in the management of chronic pharyngeal affections.

Tincture of iodine and glycerin of alum is a very excellent solution for daily application with lint or a large brush.

Bromide of ammonium solution (20 grains to 1 ounce) has been found very useful in subduing the irritability of the pharyngeal muscles, but the writer has had better results from its internal administration in full doses, the effects being much less transitory than when its local exhibition is relied upon.

The following gargle may be used before and after the use of the more radical measures:

℞.—Ammonii brom. ℥ij.
Cocainæ hydrochlor. gr. x.
Acidi carbolici ♏xlv.
Aquæ rosæ ad ℥x.—M.
S.—To be used as a spray and as a gargle for the throat several times a day.

The chloride of ammonium inhaler is sometimes of the greatest service in the later stages of treatment, and sometimes all through the ailment it affords some relief, especially when laryngeal irritation is a prominent feature.

Syphilitic pharyngitis is to be treated by remedies directed to the primary lesion—mercury in the early stages, and large doses of iodide of potassium (20 or 30 grains three times a day) in the tertiary ulcerations. Chlorate of potassium 4 drachms, carbolic acid 1 drachm in 20 ounces of rose water is an excellent application or gargle for habitually cleansing the surface of syphilitic ulcers in this region. Where they fail to show any tendency to heal under this mild treatment, the writer is not afraid to touch them over with a brush moistened (but not dripping) in strong solution of pernitrate of mercury. The solid stick of nitrate of silver may be applied, but the mercurial solution used with caution is far better. The brush should never be applied to the neighborhood of the larynx or to the healthy parts of the mucous membrane.

Iodized phenol may be used in the same way, or the ulcers, when well within reach, may be insufflated with iodoform.

The following liquid may be swabbed over the throat upon cotton wool:

℞.—Hydrarg. bichlor. gr. j.
Ammonii chlor. gr. vij.
Glycerini aluminis (1 : 7) ℥j.—M.
S.—To be used as directed.

PHIMOSIS.

The treatment of this affection is almost universally regarded as demanding the operation of circumcision. The writer hesitates to

speak strongly upon a subject belonging so exclusively to the domain of surgery, but the experience of several years' surgical practice in a children's hospital, and his repeated opportunities since then of seeing the evils resulting from the elongated and narrow prepuce as they continually present themselves in medical practice, has forced him to form a very definite opinion upon the subject.

After practising the operation of circumcision upon numerous occasions, he met with some cases in children and in adults where the operation would not be permitted, and being forced to try the effects of dilatation, he was surprised to find that in every case in which he had the opportunity of testing its value this measure resulted in complete success. In the case of a child whose narrow preputial orifice scarce admits a stout probe, a few sittings suffice to dilate the contracted opening by inserting the blades of a very fine forceps in the closed state, and gradually and very gently separating the handles until the tissues are thoroughly stretched. The ordinary old-fashioned phimosis forceps, opening by means of a finely-threaded screw, answers nearly all purposes. It is almost surprising to find to what extent dilatation may be pushed without causing pain, cracking, or tearing of the prepuce. Once or twice a week is often enough, and frequently in young children the prepuce may be painlessly slipped over the glans after one or two trials with the forceps. When this has been accomplished with such ease as to render paraphimosis unlikely, the child's parents may be safely entrusted to periodically draw the prepuce back, and in the case of older children they see to this themselves. In a comparatively short period the elongated prepuce shortens, and the writer has seen several cases where a long, narrow prepuce after dilatation has been found years subsequently to have almost disappeared, leaving the glans bare as if circumcision had been skilfully performed. In two cases where an extremely narrow opening had existed from the time of birth, and caused no inconvenience until marriage, dilatation was found to effect a permanent cure in a few weeks.

Symptoms of incontinence of urine at night, bladder irritation, and stone, depending upon the condition of the prepuce, rapidly disappear after gradual dilatation by the phimosis forceps. These symptoms, however, are rarely caused by the constricted orifice, as generally stated. They arise from the irritation produced by the partial or complete adhesion or growing together of the mucous surfaces of the lining of the prepuce and the covering of the glans, and this cannot be remedied until the orifice of the prepuce is dilated so as to permit of the foreskin being drawn back and peeled off the glans by forcible scraping with the finger-nails until the head of the penis is completely bared. Occasional drawing back of the foreskin in the act of micturition effectually prevents any further adhesion of the contiguous mucous surfaces.

There is no doubt that an early circumcision, as performed by the

Jews upon the eighth day before the parts are at all developed, would be a wise law for universal acceptance, but it is often a question if the surgeon is justified in chloroforming and performing a by no means trifling operation upon older children or adults when results almost equally good in many cases may be obtained by a painless gradual dilatation.

Acquired phimosis may in many cases be successfully treated in the same way, after the irritation or balanitis has *entirely* disappeared; but where a chancre or warty vegetations are found to be present, there should be no attempt made to dilate, but the foreskin should be slit up and the glans fully exposed by first passing a director through the preputial orifice and cutting with a sharp-pointed curved bistoury or fine scissors through the prepuce at its dorsal aspect. Any useless tissue may be snipped off, and the edges of the mucous and cutaneous surfaces should be brought together by catgut or fine silk sutures.

Where in congenital phimosis the prepuce is *very much* elongated, the ordinary operation of circumcision may be performed, though the writer finds that the superfluous tissue often disappears. Being gradually pulled back, it becomes part of the covering over the body of the penis when complete dilatation has been successfully accomplished.

Circumcision may be performed in congenital cases by slitting up the prepuce as just described, but where there is much useless skin the older method is better. The surgeon, measuring the amount which he thinks necessary for removal, while the parts are in their natural unstretched position, by grasping the foreskin between the tips of his forefinger and thumb, applies the blades of a pair of ordinary dressing forceps behind his finger-nails as he puts the skin upon the stretch by drawing it forward.

Clover's circumcision tourniquet may be used instead of the forceps blades, which are liable to slip. When the tourniquet or forceps are tightened the part of the prepuce in front of it is shaved clean off with a sharp knife or pair of curved scissors. After removing the blades the skin retracts well backward, but the mucous membrane, which still is found to cover the glans, is to be slit up well back to the corona on the dorsal aspect by scissors or bistoury. In very young children sutures are unnecessary, the edges of the skin and mucous membrane being held in position by a narrow strip of lint wound round the penis. In older patients the edges of the skin and mucous membrane must be neatly brought together by fine catgut sutures.

The plan of coating over the dressings and keeping them in position by collodion is not to be recommended, as the writer has seen great trouble and intense pain caused by the removal of the application.

Any simple antiseptic lotion may be used to keep the dressings moist for three or four days, after which the parts will generally be found to be in an advanced stage of repair.

PHLEBITIS.

Absolute rest of the affected limb as the patient lies in bed is essential. Where the veins of the leg are affected the entire limb, from the toes to the trunk, should be kept in a state of repose, if necessary, by splints. The limb should be elevated by raising the mattress or palliasse. In mild cases the tincture of iodine brushed over the course of the inflamed vein often affords speedy relief. In severe cases iodine in weaker solution may be once brushed over the course of the affected vein, after which hot fomentations a few hours later on may be tried if the pain be very acute. The writer's routine method of treating severe cases of extensive phlebitis, arising out of varicose veins, is to envelop the entire leg in warm absorbent wool, over which a layer of thin mackintosh is spread so as to cover completely at every point the wool from the toes to the groin. This dressing is kept in accurate position by the even pressure of a skilfully applied woven bandage.

This application should not be interfered with for twenty-four hours, when the wool is to be replaced by a fresh coating. Poultices are certainly much inferior to this method and should only be applied when suppuration occurs. A local phlebitis affecting only a limited area should also be treated by absolute rest of the entire limb in order to avoid the detachment of the thrombus, and the application of the ordinary spirit lotion (1 of spt. vini rect. to 3 of water) upon lint, which is to be covered with oiled silk and a bandage, affords the best and simplest treatment. A smart saline purge is often very useful, and hazeline internally and as a lotion may be tried.

The following may assist in the solution of the thrombus:

℞.—Ammonii carb. ℥ij.
Spt. ammon. aromat. ℥j.
Potassii iodidi. ℥ij.
Hazelini ℥ij.
Glycerini et aquæ ad ℥vj.—M.

S.—Two teaspoonfuls in a large wineglassful of water four times a day, after food.

Abscesses must be freely incised as they appear, and attention should be directed to the antiseptic management of any ulcer, wound, or injury to which the phlebitis is secondary.

In diffuse suppurative phlebitis the grave constitutional condition must be met by abundance of stimulants and concentrated liquid nourishment and large doses of ammonia. Operative measures for the removal of any injured part which has been the starting-point of the general pyæmic infection may be undertaken, though there is but slight hope of a successful issue in such cases.

At a later stage œdema and local thickening may be removed by the pressure of an India-rubber bandage. This is much to be preferred to the ordinary elastic stocking. Massage is not to be recommended

owing to the risk of detaching clots or thrombi. Strapping the limb with mercurial plaster hastens the absorption of effused inflammatory products, and benefit may be obtained from the internal administration of large doses of iron, quinine, or iodides. The rubber bandage should be worn until long after the disappearance of all thickening, and in the case of varicose veins it should be used daily for the remainder of the patient's life.

Blood-letting, leeching, mercury, and other antiphlogistic measures are generally contra-indicated, but leeching is sometimes useful at the very commencement of a localized periphlebitis.

PHLEGMASIA ALBA DOLENS.

As this affection is generally found as a complication of the puerperal state the general condition of the lying-in patient should receive careful attention, and no harm can come of the physician insisting upon thorough irrigation of the vagina, and in special cases of the uterus with some mild and unirritating antiseptic solution as weak Condy's fluid or boric acid lotion, if such have not already been employed, provided always that its application does not interfere with the chief measure, *i. e.*, rest. This is to be as complete and thorough as possible. If the patient has already got up and moved about she must be put back to bed. The position of lying upon the back on a hard hair-mattress is the best, by elevation of the mattress or palliasse the limb should be slightly elevated above the level of the trunk.

Where there is marked fever at the onset, a full dose of quinine, or a diaphoretic mixture coutaining ½ minim of tincture of aconite and 3 or 4 minims of solution of morphine (1 : 100), with spirit of nitre and mindererus spirit, should be prescribed.

Pain will require opium, but rarely will this be needed in large amount. A good routine treatment will be to put the patient upon a pill consisting of ⅓ grain extract of opium, and 2½ grains of quinine every six or eight hours. A smart saline purgative should be administered from time to time.

In severe cases the child should be weaned.

Local treatment is of the greatest importance. As a rule, this is much overdone. Leeching is seldom required, and irritating applications or blisters are to be avoided. The usual treatment of applying warm or hot fomentations is not to be recommended, nor are poultices advisable or convenient. It may be laid down as a rule that any method of treatment necessitating frequent manipulations or changes of posture of the affected limb is to be condemned. The danger of dislodging clots or thrombi is to be always kept before the mind of the physician, especially as phlebitis is also commonly present, and for this reason friction of all kinds must be avoided. The best method to pursue is that just mentioned under the head of Phlebitis. The limb is to be carefully covered from the toes to the groin with a uniformly thick layer of absorbent cotton wool, after which one large piece of

thin mackintosh is to be used to cover the entire limb, so as to permit of no part of the wool being visible. Over all a broad, soft, woven bandage is to be evenly applied. This dressing need not be disturbed for several days if the effect of a poultice be desired, and when it is removed the skin of the limb will be found moist and wrinkled, as if after long immersion in water. As a rule, where pain or tension is not very great, this maceration of the limb is not necessary, and the wool may be changed daily. As already mentioned, the limb should be elevated by raising the mattress. In the great majority of cases the above treatment is all that is required, and if commenced at the earliest stages, much pain and tension will be prevented. When the case is not seen till the swelling and discomfort are at their height, relief may be more quickly obtained by enveloping the limb in a double layer of flannel bandages wrung out of hot water, over which the mackintosh may be adjusted and kept in position by a light calico or stocking-web bandage. Laudanum, belladonna, chamomile, decoction of poppy heads, or other anodynes may be added to the hot water, but they are seldom required.

As the acute stage passes off the wool is to be retained, but the mackintosh covering may be dispensed with when the firm, painless, doughy swelling has become established, the wool being firmly but comfortably bandaged by a woven fabric.

At a later stage a soft, dry flannel bandage may be applied and renewed morning and night, the limb being occasionally sponged over with a little tepid water, but friction with oils or liniments is to be forbidden for the reasons already mentioned. The patient may now be permitted to leave her bed for a comfortable couch, but exercise of the affected leg is to be very cautiously permitted until all danger of detaching clots or thrombi has passed away. There is considerable difficulty in restraining nurses from rubbing the limb at this stage.

After the patient begins to move about, if the swelling remains, there is no remedy so valuable as the India-rubber bandage applied every morning before getting out of bed, and taken off after she goes to bed at night, when a thin flannel roller may be substituted.

This continuous elastic pressure has been found by the writer to speedily and permanently remove doughy swelling which had existed for many months, and in one case for several years. The continuous current is now of considerable use, and massage may be most valuable, with the occasional use of iodine applications for a few days, while the patient keeps her bed. Friction, with the lin. potass. iod. cum sapone, B. P., or cod-liver oil, is also of great use.

The rubber bandage is infinitely more valuable than the old-fashioned elastic stocking, which should be discarded.

Seldom are mercurial dressings or inunctions indicated.

Warm salt baths may be tried in very chronic cases and the brine baths of Droitwich are excellent.

Hamamelis and hazeline, though much vaunted, are of little use in this affection.

The chief indication in the late stages of the affection is iron in combination with iodides and small doses of tincture of digitalis.

PHLEGMON—See Erysipelas.

PHOSPHATURIA OR PHOSPHORIC ACID DIATHESIS

There is, strictly speaking, no such condition as Prout's phosphoric acid diathesis. The condition simply means alkalinity or diminished acidity of the urine, which is a feature in many different diseased conditions. The treatment of the primary affection is thus of chief importance. Dyspepsia, insomnia, and the exhausted conditions arising out of prolonged severe mental overwork or worry, are to receive appropriate treatment.

Change of scene to a mountainous or seaside region, rest of mind, and active exercise of the body in the open air, with boating and bathing and a generous animal diet, are the best remedies. Of internal remedies, the diluted nitro-hydrochloric acid in full doses is always of considerable value, though its action can only be likely to prove useful by its general tonic effect upon the system. Drugs, such as the mineral acids, generally fail in relieving those cases where the phosphatic deposit in the urine depends upon the constant alkalinity produced by fixed alkali, nor is there any great reasons for active drugging, as calculi seldom form out of the amorphous phosphate of calcium. The indications, as above stated, are not for chemicals, but for measures calculated to improve the general health.

The same remarks apply to some extent, also, to those cases where the phosphatic deposit is caused by volatile alkali, but local treatment is of the greatest importance, and Roberts has shown that the injection of 1 drachm of dilute nitric acid into the bladder when diluted with 10 ounces of warm distilled water once daily soon dissolved the phosphatic deposit which rapidly formed upon the surfaces of an old calculus which had been crushed with the lithotrite.

The bladder must be brought into a healthy condition, and ammoniacal urine should be remedied or prevented by the most scrupulous cleanliness as regards catheters, sounds, etc., and by the frequent irrigation of the bladder by a weak nitric acid injection. Since first using boric acid internally in bladder affections associated with an ammoniacal or putrid state of the urine, the writer has almost ceased to wash out the organ, as already mentioned. The effect upon the urine of even small doses (8 to 10 grains) of the acid by the mouth is generally surprising.

PHOSPHOROUS POISONING—See Poisoning.

PHOTOPHOBIA—See Under Conjunctivitis, Cornea, etc.

PHTHIRIASIS.

The treatment of the cause of this affection is described at length under Pediculi. After means have been undertaken for the destruction of the parasites, the excoriations, eczema, impetigo, and other lesions produced by scratching or by the irritation of the insects, should receive appropriate treatment. Their managsment is detailed under the heading of each affection, and appropriate remedies must be used when they do not rapidly subside.

PHTHISIS.

The treatment of pulmonary phthisis requires more space than can be devoted to it in the narrow limits of the present volume. Hence only an outline of the most approved methods of dealing with the disease will be attempted. At the outset the question must be answered—Is phthisis curable? The weight of all respectable authority is every year becoming more and more emphatic upon this point, and a decided answer in the affirmative must be given by every observer who approaches the problem with an open mind. As already pointed out in discussing the treatment of various other affections, the secret of success often depends upon the spirit in which the physician and patient enter upon the struggle with the disease.

Until within the past few years the discovery of a tubercular deposit in any region of the body was almost universally regarded as leading to a fatal issue. The recent strides made in abdominal surgery must convince the most sceptical that extensive tubercular disease of the peritoneum which has been seen and handled by the surgeon has been proved beyond doubt to be curable in many instances. The physician who regards as a case of mistaken diagnosis every case of pulmonary phthisis which has yielded completely to treatment, is certainly not keeping abreast of the tide of progress and knowledge.

The successful treatment of pulmonary disease may be, upon the other hand, also seriously retarded by the blind belief in the efficacy of many drugs which, at the best, can only be said to possess feeble action over the affection. Nevertheless, the impartial observer must be convinced that very substantial progress is being made since the days of leeching, blistering, and antiphlogistics.

Drugs should play a very minor part in the treatment of phthisis. The main reliance must be placed in *hygienic* measures, as soon as the family history, symptoms general and local, and the physical signs warrant the physician in arriving at a diagnosis of the disease.

The writer is accustomed to keep ever before his mind in dealing with phthisical patients the facts demonstrated by Metschnikoff and applying these to the treatment of phthisis. He regards the question of its cure as being one of "phagocytosis." It will probably be demonstrated soon that the agent which so modifies the action of the phagocytes as to secure the proper performance of this process will be the

one upon which our hopes are to depend for destroying the disease. (See this question discussed along with Koch's lymph under the heading of Tuberculosis.)

The clothing of the phthisical patient in this country, if left to his own choice, is almost certain to be injurious. He selects heavy garments, and wears too many of them, so that the least exercise induces perspiration and increases the risk of chills. Woolen garments should be worn next the skin, and in winter these may be changed for heavier or thicker ones of the same material. They should be changed often. In very severe winters a chamois vest may be worn, but if so, it is better to have it perforated; it may be worn over a light merino fabric.

The fabrics should be such as will speedily absorb perpiration, and it is much better to arrange for moderate extremes of temperature by overclothing which can be easily removed. A light overcoat, which can be easily put on and off in summer, will enable the patient to do with less underclothing, and in this way continual overheating and chills may be avoided after exercise. The feet and legs should be protected against damp and cold. It is more difficult to arrange the clothing of lady patients; but such directions should be given as will lead them to sacrifice their ideas of fashion to their health, for, although a matter of detail, it is a very important matter. Too much clothing is often a more serious mistake than too little. In driving or travelling the warmest coverings are essential.

Food is of far more importance than medicine, and practically there need be no limit set to its amount. As much as the patient can be tempted to swallow may be administered. A well mixed or varied diet is the best for a consumptive patient in the early stages. It should be carefully cooked, and served in the most tempting fashion, and the writer has sometimes felt that a good cook was of more importance than a therapeutist. Fats should, when possible, form an important item in the daily food, and an abundance of milk, eggs, and butter is generally within the reach of all, and they do not demand in their preparation much scientific knowledge of cookery. When the temperature is elevated, and the digestive organs weakened, the patient may have to rely entirely upon a milk diet, and experience has proved that this of itself is a most valuable dietary in all stages of phthisis. Some patients can take cream. To live upon milk, four pints, at least, in the twenty-four hours, will be required to meet the demands made upon the system; but as the great aim in dealing with phthisical patients is to administer more than is required to meet the waste, and to so improve the nutrition as to considerably add to the body weight, a much larger quantity will be necessary.

In some of the "milk cure" establisments more than double this amount is given. When the patient objects to raw milk, it may be cooked in various ways, or mixed with kali or lime-water, or made into whey or koumiss. As already stated, *good* buttermilk turned slightly acid, is one of the most valuable and palatable of foods, and is

often relished and taken in great quantity when every other form of milk is distasteful. A favorite beverage with milk drinkers is to mix equal quantities of fresh cow's milk and buttermilk together. Milk, warm from the cow, is believed to be more digestible than the cold liquid. A little good rum added is a great improvement. Jaccoud advises phthisical patients to repair twice a day to the cow-house to drink the milk warm from the milking pails, and to inhale the moist sedative atmosphere of the place for some time, so as to have laryngeal and bronchial irritation soothed.

Where the digestion is weak, the milk may be peptonized by Fairchild's, Savory & Moore's, or Benger's preparations. Rennet is often relished when these are distasteful.

The milk of the mare, ass, goat, and sheep may be used, and the first two kinds of milk are easily digested. The koumiss made from the fermented milk of the mare is a highly-prized Russian remedy for phthisis. The English koumiss, made from cow's milk, and supplied by the Aylesbury Dairy Company, may be used instead ef the natural Russian article. This food is of no use unless it can be procured and used in large amounts, and patients soon weary of sending for it. The writer has had great satisfaction from home-made preparations, and when patients are taught to make their own beverage from materials which they know to be free from any objection, they often take it when they object to a foreign article, like the Russian koumiss or kefir.

Either of the forms given upon page 578 of the 5th edition of the writer's book on *Materia Medica and Therapeutics* may be used. That of Ponomaroff is sooner ready for use.

In the absence of yeast, a palatable and highly nutritious beverage may be prepared by mixing one part of fresh rich buttermilk and one part of water with eight parts of cow's milk, adding a very little loaf sugar, putting the mixture into a loosely-corked gallon jar, leaving it in a *warm*, but not hot, place beside the fire, where it may be frequently and briskly shaken, and in thirty-six to forty-eight hours it is ready for use as a pleasant, sharp-tasted, thick liquid, which slightly effervesces. Some little skill and experience is required in producing a uniform result, and the patient should not give it up if the first and second results are unsatisfactory. After the first batch of this artificial koumiss has been successfully prepared the use of buttermilk may be entirely dispensed with, as an equal bulk of the koumiss liquid can be used instead, in the preparation of each subsequent quantity. Some patients succeed best by leaving out the sugar entirely, and by shaking the mixture very seldom during the first twenty-four hours. Where a phthisical subject takes to this home-brewed koumiss, as a rule all difficulty in feeding is overcome; but the article known as buttermilk in England will not make koumiss. The artificial kefir mentioned in the volume above referred to is made upon a somewhat similar principle.

In the intervals between feverish attacks, animal food in abundance

may be given. Beef tea is admissible when little else can be got down, but too often phthisical patients are starved upon it.

Raw meat is a favorite dietetic agent in treating phthisis in France. The meat is passed through a mincing-machine, scraped with a knife, pounded in a mortar, or rubbed through a seive, or rolled into pellets and covered with chocolate.

Fish, poultry, game, oysters in abundance, and, in fact, every food which is considered easy of digestion and highly nutritious may be allowed without stint, always provided that farinaceous, fatty, and fat-forming stuffs are allowed a good place. Weber objects to potatoes and all foods which contain potash salts, which, he argues, encourage the growth of the tubercle bacilli.

Malt extract is of great value, but the writer prefers to administer it in combination with cod-liver oil, which will be referred to when speaking of drugs useful in phthisis.

The system of forced feeding, over feeding, or "suralimentation" introduced by Débove, consists of introducing a soft rubber stomach-pump tube, and filling the stomach with liquid food, as milk broths, etc. In this way he finds food is always retained when everything is rejected after swallowing. Meat dried and powdered is mixed with milk until a uniformly fluid compound is obtained, which is given until finally the equivalent of three pounds of meat is administered daily by the mouth without the tube. Excellent results are reported from this treatment, and Débove maintains that the *suralimentation* augments combustion, and so enriches the blood as to prevent the growth and development of the bacilli. From the writer's point of view, he would explain these results by supposing that the *suraliment* method stimulated phagocytosis.

Yeo gives the following scheme as a suggestion for a dietary for the consumptive patient:

"*On waking in the morning* a tumblerful of milk should be taken mixed with a little hot water, to which it is often useful to add a few grains of common salt and bicarbonate of sodium, especially when a certain amount of accumulated mucus has to be got rid of by expectoration. There is no objection to taking a little tea, coffee, or cocoa at this hour, with milk or cream if preferred. Sometimes the stimulus of a tablespoonful of brandy, rum, or whiskey is needed at this hour. The first meal is often best taken in bed. About an hour afterward a substantial breakfast should be taken consisting either of broiled bacon and lightly-boiled eggs, or some fresh fish, or some cold meat, or game or poultry, and with this meal, milk or cocoa, or coffee or tea, or some good, sound, light wine and water may be taken according to taste.

"Supposing this meal to be taken about nine or ten o'clock, a glass of milk or a cup of beef tea may be taken about noon.

"Half-past one or two o'clock is a good hour for the chief meal of the day. This should consist of some fish, when it can be procured fresh and good, together with some meat, chicken, or game, and fresh

vegetables, and some light milk-pudding, with a little marmalade or other cooked fruit. With this meal half a pint of good Hungarian wine, light claret or Burgundy, or an equivalent quantity of brandy or whiskey and water may be taken.

"At five in the afternoon, another glass of milk should be taken, or a cup of thin chocolate, or tea with plenty of milk or cream, or the yolk of an egg beaten up with a little brandy and water may be substituted, if preferred. It is rarely desirable to order any solid food at this hour, if it is intended that the patient should make another substantial meal at seven. At this hour a meal similar in all respects to that taken at half-past one or two o'clock should conclude the substantial feeding of the day.

"About half an hour before bed-time (which should not be later than ten or half past), another glass of milk prepared in the same manner as that in the morning, together with one or two tablespoonfuls of brandy or whiskey, or a cup of arrowroot or beef tea, or tapioca soup, according to taste, may be taken. Finally, some provision of light nourishment mixed with a little stimulant, should be arranged, in order to be taken during the night when woke by coughing, or after perspiration, or when merely restless.

"A glass of Vichy water taken warm half an hour before meals, as recommended by Germain Sée, may be found useful in some cases to promote the secretion of gastric juice.

"In distinctly febrile cases a much more fluid dietary will have to be allowed, and the food will require to be taken at shorter intervals."

The question of alcohol in large quantities in the treatment of phthisis has led to sharp differences of opinion. Flint mentions the case of a young woman, where twenty ounces of whiskey were used daily for two years, and the patient recovered. As a rule, it may be said that stimulants are not advisable in the early stages, except where experiment proves that they increase appetite and assist digestion. They should always be administered along with the food, and any good, sound, light wine may be permitted.

In the stages of the disease where softening of the lung has occurred, Whiskey may be allowed in fair quantity, and if mixed with the patient's milk any reasonable amount may be allowed without danger of doing harm. By giving it in this way, cough may be eased, diarrhœa checked, sleep produced, fever diminished, and waste retarded. It is obvious that in the class of cases referred to, a fatal issue is most likely to be the outcome of the disease, and therefore the moral objection to creating an alcohol habit is not so serious as under other circumstances.

Fresh air is of almost equal importance to food, and it is perhaps to the recognition of this fact more than to anything else that the improvement in the management of phthisical cases has been owing. Dr. Henry MacCormac, by his early appreciation of the evils attending the inspiration of re-breathed air, has done more for the preven-

tion and treatment of pulmonary consumption than any other pioneer of progress.

Day and night the most free ventilation of sleeping and sitting rooms, or apartments in which the patient is carrying out his daily avocation, is of the utmost importance. This is a difficult part of the treatment to carry out effectually, as phthisical patients, owing to their being constantly too heavily clothed, soon become abnormally sensitive to currents of cool air, and the horror of "draughts" or "catching cold" is a bugbear which must not be permitted to take entire possession of the patient. The writer is inclined to think that the tendency to catch cold, which is undoubtedly present in most phthisical patients, is engendered by the excessive clothing generally worn. It is rare that the patient can be induced in this climate to sleep with the bedroom window open all night, and the physician should insist upon a free egress of the vitiated air. A talc ventilator put into one of the chimney flues, and a Toban's tube, or Tait's thermic ventilator, are most valuable additions to the host of remedies. The situation of his bedroom should be such as will prevent the exposure to cold east or north winds, and his residence should be upon a dry sandy and not upon a moist clay soil.

All his available spare time should be spent in the open air, and by wise wrapping in suitable clothing he should so continually accustom himself to an outdoor life as to be able to expose himself without danger, even in unpromising weather.

All sorts of outdoor games, amusements, and exercises should be freely encouraged, and whatever tempts the patient to remain as short a time as possible in the house should be cultivated. The amount and kind of exercise must of course be tempered to the condition of the patient; and where there is a constant tendency to hæmoptysis, rowing, cricket, lawn tennis, or other active exercise must give way to sailing, driving, or leisurely walking. In city clerks and those leading a sedentary life, where open-air exercise must be very limited, if found in the early stages gymnastic exercises in a lofty, well-ventilated gymnasium are often of much value; and Williams advised these to be pushed even to the extent of producing emphysema in the diseased lung, as others have advocated bugle or trumpet practice with the same object in view. Horse-riding or cycling may be freely indulged in.

In those cases where cure has followed change in occupation and climate the factor probably deserving the most credit has been the open-air life which has been thus forced upon the patient, and of all the hygienic measures advocated in the treatment of pulmonary consumption this must be regarded as the most vital.

Therefore, when possible, the patient should be induced to give up his occupation for one which will allow him the longest time in the open air; and habits of life which interfere with outdoor exercise in the wealthy must be given up if the disease is to be checked.

It is sometimes astonishing to observe the results which follow upon a patient being thus lifted out of his unhealthy environment; and one might say that, given a case of phthisis in the early stage, the prognosis will chiefly depend upon the extent to which the habits and environment of the patient are susceptible of improvement. Hence the necessity of the most rigid investigation into every surrounding of the victim of phthisis in the early stages.

Climate is a factor of great importance, and as improved methods of travelling have brought temporary or permanent change of residence within the reach of most patients, the question of climatic treatment is daily becoming more important, and many volumes have been dedicated to the elucidation of this valuable means of combating the disease. Unfortunately, much difference of opinion exists among those who have given special attention to the subject of health resorts, regarding the relative value of various localities; and it is therefore most difficult to lay down general rules for the guidance of practitioners in selecting the best climate for individual cases of phthisis.

Looking at the subject broadly, the writer is accustomed to formulate for himself the general rule *that the climate which affords the greatest facilities for spending the largest amount of the patient's time in the open air is one most likely to lead to the best results in most cases.*

It is, therefore, wise in approaching the climatic method of treatment to regard it chiefly, but not altogether, as a mere variation of the open air or out-door plan of treating phthisis. Climate will generally be found to accomplish little if the patient carries with him his sedentary habits, late hours, and dislike to open-air exercises, and it is the duty of the physician to impress upon him forcibly that it is not the climate *per se* that is the chief or only factor, but that he must avail himself to the very fullest extent of the opportunities of spending all his time in the open air which is impossible in his own variable climate.

The advantages obtained by a long sea voyage are, perhaps, greater than those resulting from a residence in any health resort for a similar period of time, and upon the whole it is deservedly held in the highest esteem as a therapeutic agent. A long voyage in a good sailing ship from England to Australia is a powerful remedy in restoring the phthisical patient to health. It is here that the maximum amount of a perfectly pure atmosphere can be enjoyed from early morning until late at night. Exercise can be had all day, and Professor Charteris advises that a pedometer should be used to mark the mileage, which should be two miles before breakfast, three before luncheon, three before dinner, and two before turning in at night. This is worth noting, as there is danger of the patient being seized with that listless idleness which sometimes paralyzes every tendency to exertion when at sea.

Hemorrhage is no barrier to the ocean voyage, and except the consideration of discomforts from the absence of home luxuries, isolation from friends, and the risk of the complications and exacerbations which are liable to happen also upon land, even advanced cases of the disease may be safely committed to the risk of an ocean voyage, if the patient be informed of his exact position. The practice of sending patients away in the last stages of the disease in search of health when death is soon inevitably near, is to be condemned, but some patients, who, in the advanced stages of phthisis, take the notion of a long voyage and persist in carrying it out in spite of the remonstrance of their friends and physician, often return wonderfully improved. Cases of limited first or third stage of hemorrhagic phthisis where the patient's strength is unequal to much exercise, and where he has suffered from close confinement in a crowded city is, in the opinion of Williams, those most likely to be benefited by a long sea journey.

The ocean journey may be undertaken in a sailing vessel about the middle of September, so that the return of the patient may fall in with the early summer after the disappearance of the dreaded east wind. It does away with the difficulty of selecting a health resort unless this problem will require to be met after his return.

Where a journey to Australia or New Zealand is out of the question the health resorts nearer home may be considered. Bournemouth and Ventnor are the best suited for the majority of cases, and it is the experience of the writer that excellent results may be obtained from a winter in the first mentioned, often better than when the patient has to put up with the fatigues and inconveniences of a longer journey. The dry, sandy soil of Bournemouth, the shelter which it obtains from the prevailing winds and the beneficial influence of its neighboring pine plantations, render it a valuable resort to those who cannot go further. Ventnor is to be preferred where a marine atmosphere is desired. Torquay where a moist sedative air is required in the presence of extensive bronchial irritation. Rothesay is the best of the Scottish winter sanitaria.

Glengarriff and Rostrevor are the chief winter resorts available in Ireland, and they afford excellent climatic advantages.

The dry climates of Egypt, Tangier, Algiers, Morocco, the Riviera, Malaga, the Cape, Tasmania, and Australia, have been continually proved as of greatest benefit to the consumptive.

Dr. Lindsay points out the dangers to which consumptives may be exposed in the Riviera, owing to the prevalence of the dry biting "*mistral*" wind. He, therefore, prefers Mentone as being the most sheltered beyond comparison of all the Riviera resorts, and especially suitable where there is an irritable bronchial mucous membrane, and an intolerance of wind.

San Remo, though less sheltered, is drier, warmer, and more equable.

The moist temperature of Madeira and other relaxing or sedative

marine climates is not indicated, except where catarrhal conditions prevail, or where laryngeal complications exist.

Arcachon and Biarritz are excellent autumn resorts, and the patients can leave them and proceed to the Riviera, Algiers, or Madeira, as winter sets in.

The tendency of modern authorities is toward giving the *high altitude* treatment of phthisis the first trial when climatic therapeutics has been warranted by the history, symptoms, and physical signs. The extraordinary purity of the air and the low barometric pressure tend, with other considerations, to produce a most beneficial effect upon the lung tissue, which is the seat of disease, as well as to produce hypertrophy, and even vesicular emphysema and expansion of the chest, as believed by Williams.

It is this principle which has led to the popularity of the high altitude resorts. The *stillness* of the air, its great *purity*, *rarefaction*, and *dryness*, the absence of fogs and the prevalence of ozone and bright sunshine, render Davos a favorite sanitarium for the victims of phthisis. Even in the depth of winter the patient can safely sit out in the still pure atmosphere in bright sunshine, when the thermometer is below freezing point, and at night he can sleep with open windows.

Appetite increases, the lungs expand, night sweats and fever subside, hemorrhage is less likely to occur, and many patients return without any symptoms of the disease, having also left their physical signs behind them. The rarefaction of the air is, of course, a most important factor in producing these good results. Dr. Lindsay lays stress upon the inadvisability of sending patients to Davos who are not capable of supporting and responding to the highly *stimulating* climatic conditions prevailing there. Where sedative measures are indicated, low-level climates should be selected.

By the majority of authorities, the following classes of cases should not be sent to high-level resorts:

Patients with serious cardiac or valvular lesions, much bronchitis, emphysema, where the symptoms are acute or the fever *high*, where there is laryngeal or intestinal ulceration, where the disease is so far advanced as to prevent exercise; also, the old and very young had better remain in low-level regions. Those of very excitable temperaments, in which insomnia is marked, and those suffering from albuminuria, should not try the high altitude, unless they have had previous experience of it.

It is better that the ascent should be gradual, and early in September is the best period for reaching Davos. After the expiration of six months, the patient may safely move toward the sea level, to return to Davos again in the early winter, if necessary, or he may spend his summer with great advantage in the Engadine, or Weisbaden, Baden-Baden, or Geneva.

The Peruvian Andes and Rocky Mountain resorts are also much valued. Professor Charteris thinks highly of the Denver sanitaria.

Santa Fe de Bogota, in Granada, is an ideal high altitude resort, in which the patient need never feel cold.

Bloemfontein, in the Orange Free State, Kimberley, and the Transvaal are also resorts which have given excellent results, but they are only suited to those whose strength and vigor are but slightly impaired by disease, as the journey is rough and tedious. Camping out in these regions is a practice which, if the patient can follow it, is sure to lead to the best results which can be expected from climatic treatment in the earliest stages of phthisis.

The treatment of phthisis by drugs, as already stated, is of considerably less importance than its management by the hygienic measures already enumerated. This statement would, perhaps, be universally accepted if he would include cod-liver oil as a food among the hygienic remedies. Cod-liver oil, if regarded as a medicine (butter has, however, quite as good a right to rank as a medicine), stands at the top of the list. Space will not permit of a discussion upon the various theories of how it acts in phthisis. Suffice it to say, that it is more easily absorbed than any other oil or fat, and that it possesses the power of aiding the assimilation of other foods, which would not be absorbed except in its presence.

The surprising results following the inunction of cod-liver oil over the abdomen of children suffering from abdominal phthisis and wasting diseases has been already mentioned. (See page 507.)

The methods by which the oil is dispensed or compounded in order to render its disagreeable taste and smell less obvious are legion. As a rule, the perfect emulsions are made by sacrificing the therapeutic value of the oil. The writer has practically abandoned all emulsions and compounds, and prescribes the oil in combination with the Kepler extract of malt, the most perfect and efficacious of all restoratives in wasting diseases. Occasionally its viscidity turns fastidious patients against it, but this is generally remedied by persevering with it for a time. The oil should be given always soon after food, and it is a good plan to be content with a small dose at bed-time only for a few nights, after which it may be given three or four times daily. A teaspoonful is enough to begin with, but half an ounce of the oil or a very large tablespoonful of the mixture of oil and malt extract should be administered after each staple meal. The oil may be given with pancreas by the rectum. (See next page.)

Febrile disturbance, as evidanced by a moderately high temperature and furred tongue, is a barrier to its use. It is a mistake to force it under such circumstances; the best plan then is to get the digestive organs made right first with a simple saline mixture like the following, which is a good formula for the sub-febrile troubles arising during any stage of phthisis:

℞.—Potassii bicarb. ℥vj.
Morphinæ hydrochlor. gr. ¾.
Acid. hydrocyanici dil. ♏x.
Aquæ dest. ad ℥viij.—M.

S.—One large tablespoonful with as much fresh lemon juice, every four hours, to be taken while effervescing.

Malt extracts have been used, and they are, doubtless, of value in assisting the digestion of starchy foods; but if the combination of oil and malt extract already mentioned is tolerated by the stomach, there is no necessity for further use of these drugs.

Pancreatic emulsion, containing an emulsified and pancreatized animal fat, is highly recommended, but to most patients it is objectionable, and the writer has ceased to use it. Where a pancreatic ferment is considered necessary or advisable to supplement or assist the human secretions in their digestive functions, trypsin, pancreatin, Benger's liquor, or Fairchild's pulverized extract may be used for mixing with the food. Weir Mitchell's method of administering cod-liver oil and pancreas is the best of all, if the patient can be got to take the trouble to use it, and it is an excellent plan where the oil cannot be tolerated by the stomach. Enough of water to cover 8 ounces of chopped beef pancreas is allowed to stand in a warm place for an hour. It is then squeezed through a towel, and 1 ounce of the juice is rubbed up with ½ ounce of pale cod-liver oil, and injected three times a day into the rectum.

Lamb sweetbreads, which are cheap and easily procured, make one of the most palatable and nutritious dishes for the consumptive. They come in very well in the months when oysters are not to be had. They are best boiled for a few minutes in a very little water, and then stewed quickly in a saucepan with a small quantity of butter.

The hypophosphites are believed by many to possess great efficacy in the early stages of phthisis, and the various quack syrups which are much used by the public are not without their therapeutic value; but, as a rule, those whose composition are known, when prepared by any respectable chemist, will be found to give more satisfactory results than the highly advertised nostrums. The syr. hypophosphitum comp. of the B. P. C. formulæ is an excellent and reliable preparation, as is also Fellows' syrup. The quinine and strychnine may be omitted in the first-mentioned compound, when the effects of the hypophosphites of iron, calcium, manganese, and potassium only are desired. The U. S. P. syr. hypophosphitum may be used.

When administered in conjunction with cod-liver oil, there can be no doubt that these drugs are most valuable in the early stages of phthisis and in very chronic cases.

The treatment of pulmonary phthisis by drugs since the discovery of the bacillus of tubercle is one of ceaseless activity, and of incessant changes. Up to the present, unfortunately, little progress can be re-

ported in the treatment of the disease by germicides, though every known substance whose action is inimical to the life of minute organisms has been administered. Of all these trials, by far the best results have been obtained by creasote. The writer has used it for several years past, and can testify to its great value in relieving cough, lessening expectoration, lowering fever heat, checking night-sweats, and improving the appetite and digestion, and diminishing diarrhœa. As he never used it alone, but always in conjunction with all of the agents already mentioned, or as many of them as could be exhibited in each case, he cannot speak definitely about its specific or curative properties, but numerous observers testify to its specific action in phthisis. In basilar cavity in the lung, where decomposition of the sputum is evident from the fetid odor of retained secretion, there is no remedy to equal full doses of creasote. In one case recently under the writer's care the most surprising results followed, and rapid healing of the cavity took place, but there was not evidence that the affection was tubercular.

Many thousands of cases have been treated, especially in Germany and on the Continent, during the last few years, and the reports of Von Brunn, Guttmann, Sahli, Bourget, Szendiak, Kossow-Geronay, Watson, Seitz, Fawitzki, Nobili, Brzezinski, Sommerbrodt, Gimbert, Bouckhardt, Flint, B. Robinson, Jaccoud, Fränkel, Leech, Boganovitch, and hosts of other observers go, upon the whole, to prove that in creasote, when properly administered, we possess the best known drug for the treatment of phthisis. An examination of the reports of most of these observers will show that they have given much larger doses than are usually administered in this country, 10 to 20 grains daily being often administered for long periods. The writer has rarely exceeded 5 grains daily; but it is his intention to push the drug, since the larger doses have been given with so much advantage, and without ill effects.

Guttmann finds that the tubercular bacillus grows but feebly in a 1 : 4000 culture with creasote, and he calculates that the ingestion of 15 grains daily would charge the blood to this extent. It must be remembered that the bacilli probably are already struggling to maintain an existence in the body against odds created by the vital agencies always exercising a hostile influence against intruders, and it is quite reasonable to expect that a small amount of a drug like creasote introduced into the system might, under such conditions, be able to turn the scale against the parasite.

It is, however, a mistake to theorize too closely in a matter of this sort. It is just possible that the drug may exert no such influence in the body, but that all its beneficial action may be owing to its effects upon digestion, assimilation, or other vital functions which lead to a healthier or more resisting condition of the blood and tissues. It seems possible to the writer that the good effects of creasote may be owing to its causing such a change in the cells of the blood and lymphatic system as stimulates the natural progress of phagocytosis. (See under Tuberculosis.)

Many drugs introduced under totally erroneous theories have nevertheless been found to accomplish the desired object, though in a very different way. The reports of the efficacy of the drug under consideration cannot be ignored, and there is fair ground for hoping that improved methods, whereby larger doses can be administered without evil, may give still better results.

Pure beechwood creasote only should be used. This is now easily obtained in elegant small soft capsules, each containing one grain.

Professor Robinson recommends, when ordering creasote, that the article manufactured by Morson or Merck should be specified. Many authorities object to the capsule on the ground that when it empties itself in the stomach a localized active inflammation must result. This is a mistake. As the capsule slowly dissolves, its contents gradually mix with those of the stomach; and even when given fasting no harm can result, much less can injury be likely to follow when the capsule is given along with or after food. The writer has given these capsules very frequently in gastric affections and often in ulcer of the stomach, when no food had been taken for days, and he never saw the least irritation or other untoward result follow; and he believes the capsular form to be by far the best method of administering the drug. It is unfortunately rather expensive, and for this reason outside hospital extern practice.

The pilular form is generally most unsatisfactory, and a mixture containing the drug is most unpleasant. The following formula may be useful:

℞.—Creasoti purif. (Morson) ♏xxx.
Spt. cinnamomi ʒiv.
Tinct. aurantii amari ʒijss.
Glycerini q. s. ad ʒiv.—M.

S.—One teaspoonful to be taken in a little water three times a day after meals, the bottle being shaken.

Keferstein recommends—20 grains creasote, 6 drachms alcohol, 6 drachms syrup, and 3 ounces cinnamon water.

Robinson uses—beechwood creasote, 6 minims; glycerin, 1 ounce: whiskey, 2 ounces.

Keferstein dissolves 45 minims in 1 ounce of tincture of cinnamon, of which 50 *drops* may be taken in half a cup of warm milk or a little wine. The formula for his pills is better; they should be coated with gelatin:

℞.—Creasoti gr. lx.
Pulv. althæ rad. . } āā ʒjss.
Pulv. glycyrrhiz. rad. }
Mucilag. acaciæ q. s.—M.

Make a mass and divide into 120 pills.

Rosenthal highly recommends creasote to be given in carbonated water.

Guaiacol is the chief therapeutic constituent of pure beechwood tar creasote, in which it sometimes exists to the extent of 90 per cent. Chemically it is the monomethyl ether of catechol or pyrocatechin, and is much less objectionable than creasote in taste and odor. It can be had in capsules, and sometimes may be tolerated when creasote disagrees. Sahli and Fränkel have used it extensively in the treatment of phthisis with what may be regarded as very satisfactory results. It may be given in pill, mixture, or capsule. The usual method is in solution in some spirituous liquid or tincture, as in the case of creasote. Three minims is a fair dose, which may be elegantly administered in sherry or tincture of orange peel. The writer can only speak from a limited experience of the drug, but the literature of the subject is extensive and most encouraging.

The internal administration of creasote may be easily carried out at the same time that cod-liver oil and hygienic measures are being used. Indeed, some physicians mix one minim of pure creasote with two drachms of the oil for administration three or four times a day, after meals, and double this quantity can often be taken without producing nausea or disgust.

The creasote treatment is advantageously assisted by inhalations of the drug. These will be referred to later on in speaking of the administration of remedial agents by the respiratory tract. It has also been given subcutaneously.

Bourget carries out the creasote treatment to the fullest extent by what is known as the "intensive method." By this plan the patient's system is saturated with the drug through various channels. Thus, guaiacol is given by the mouth, dissolved in wine in summer and in cod-liver oil in winter, until about 1 gramme (15 grains) daily is gradually reached. Where it causes nausea, and sometimes even when it is well borne, he alternates the mouth method with that of rectal injections. At the same time every night a mixture of creasote and cod-liver oil (1 : 10) is rubbed into the skin over the chest and armpits and abdomen, while as often as possible during day and night creasote is sprinkled upon an inhaler.

Recently Picot, of Bordeaux has obtained very striking results by the hypodermic injection of from 1 to 3 cubic centimetres into the supraspinous fossæ, of a mixture of guaiacol and iodoform in sterilized olive oil and vaseline. Each cubic centimetre of the fluid which is transparent and bright contains 1 centigramme of iodoform and 5 centigrammes of guaiacol. Sweating and fall of temperature follows each dose, but the reaction is not marked. Iodide of potassium appears in the urine.

He reports that he has seen no such improvement after the use of any other drug. The general condition improves, cough and expectoration are lessened, while cavities dry up and cicatrize. In the

later stages of phthisis cough and expectoration are also lessened, while night-sweats and fever may disappear, and the number of the bacilli in the sputum undergoes diminution.

Sulphur in various forms has been long employed as an anti-phthisical agent, and since the discovery of the bacillus it has again come to the front in many new methods. The old plan consisted in the administration of the crude drug by the mouth, or by the administration of any of the sulphur waters, and a residence at some of the natural sulphur springs was considered and is still considered to be highly efficacious. Sulphur is an excellent expectorant, and is partly excreted by the bronchial mucous membrane. The writer has long praised the onion (which contains much sulphur) as one of the best known expectorants. Sulphur seems, to some extent, to fulfill Brunton's ideal of a substance which should be looked for, and which would undergo slow decomposition in the intestine, or in the body generally, and give off slowly and constantly volatile antiseptic products to be excreted by the lungs.

Hitherto it has not been administered in such a way as to give hopeful results, though Witherle believes he has influenced the disease by giving small doses of the sulphide of calcium ($\frac{1}{2}$ grain in pill) every hour until the system is saturated.

The apparently barbarous method of Bergeon, by which large quantities of sulphuretted hydrogen diluted with carbon dioxide, are administered by the bowel, can hardly be said to be making much headway. He uses a caoutchouc bag of the capacity of about one gallon. This is filled with CO_2, and connected with a Wolffe's bottle, which is attached to a tube and nozzle for introduction into the rectum.

The Wolffe's bottle being filled with a natural sulphuretted water, the compression of the bag causes the CO_2 to bubble through the sulphuretted water and pass on into the intestine of the patient. Ten ounces of the water was used, and the entire contents of the bag were made to pass through this and enter the bowel at each sitting twice daily. There is much question about the real agent in producing the amelioration in the patient's symptoms—for amelioration as regards fever, cough, appetite, expectoration, and emaciation does occur.

Some observers, among whom is Dupont, affirm that it is the CO_2 which is the active agent, though Beaumetz states it is the sulphuretted hydrogen, notwithstanding that Wood maintains that there is no evidence that this agent has any toxic effect upon disease germs.

Bardet's method of using the H_2S injections is different. He uses a solution containing 10 grammes of calcium sulphide in 100 cubic centimetres of distilled water. One cubic centimetre of this solution sets free 10 cubic centimetres of H_2S when treated with an acid solution consisting of 25 grammes of tartaric acid and 1 gramme of salicylic acid in 100 cubic centimetres of water.

One cubic centimetre of the acid solution displaces the H_2S of 1 cubic

centimetre of the sulphide solution, and thus the amount injected is easily calculated.

Wood's suggestion that rectal injections of sulphuretted hydrogen water should be used instead of the gaseous injections is a good one.

The writer, without any personal experience of the gaseous injections, after wading through the voluminous and contradictory reports of this method as practised by numerous experimenters, is perfectly satisfied that equally valuable and more constant results can be obtained by the administration of natural sulphur waters by the mouth.

Sulphites and hyposulphites, with inhalations of sulphurous acid, have been used upon the same principles.

Bergeon now advocates rectal injections of CO_2, and others give a bicárbonate by the mouth, followed by an acid soon afterward in order to disengage CO_2 in the stomach. This is excreted by the pulmonary tract, and is *supposed* to improve the pulmonary nutrition, and increase the perimeter of the chest, and destroy the bacilli.

Arsenic has been fairly tried in phthisis, and some glowing reports of its value have been furnished from time to time. It is very difficult, however, to be certain that these good results have not been partly or mainly owing to the hygienic measures which were generally employed at the same time.

Brunton believes that by increasing the tissue changes in the epithelial contents of the alveoli it assists in rapidly breaking up and removing effused inflammatory products, and so prevents the tubercular bacillus from finding a suitable nidus, and thus the risk of converting a catarrhal consolidation into phthisis is prevented. It is only in the early stages of phthisis that the remedy is likely to do any permanent good, and notwithstanding the reports of decided successes, its administration should not be allowed to interfere with the exhibition of the more important hygienic measures already enumerated. In the later stages it sometimes checks the night sweats, and seems to have some effect upon the temperature when this is not of a very high type. Some suppose that it benefits the sweating when this is depending upon or associated with a subfebrile temperature.

Upon the same principles as are supposed to constitute arsenic a suitable anti-phthisical remedy mercury has been employed, and some sanguine therapeutists believe that in this direction lies the hope of the ultimate victory over the bacillus of tubercle. The dread of the evils attending the administration of mercury is no doubt greatly exaggerated, and the writer has seen tonic effects as well as gain in weight and vigor, and improvement in the physical signs in catarrhal consolidation after the administration of small doses of the bichloride of mercury.

Dochmann maintains that administered in the first and at the

beginning of the second stage, calomel improves the appetite, diminishes cough and fever, and dispels night sweats. Later on it reduces the fever, checks diarrhœa and improves the general condition. Biniodide of mercury in $\frac{1}{12}$ grain doses has been also highly recommended, and in the form of pulverizations it has been used with the view of reaching the bacillus directly. The bichloride has been used in a similar way in the spray form, and these remedies have also been employed for parenchymatous injections.

Martel insists upon the great value of insufflations of calomel.

Notwithstanding reports, there is upon the whole, little encouragement to be obtained from the experiences of the routine administration of mercurials in phthisis with our present methods.

Eucalyptus oil, thymol, menthol, myrtol, salol, aristol, oil of cloves, naphthol, balsam of Peru, aniline, ozone, oxygen, peroxide of hydrogen, carbolic acid, phenyl-propionic and phenyl-acetic acids, mullein, homeriana, helenin, sulphocarbolates, benzoic acid, chloride of calcium, chaulmoogra oil, terebene, chloride of sodium, salicylic acid, iodoform, turpentine, iodides, and tannin, have each one lately been reported by different observers as having special or specific action upon the bacilli when administered internally. Except the last remedy nothing need be said of the efficacy of these agents, their virtues as anti-phthisical remedies will require much stronger evidence in their favor than is at present available. Tannin has numerous patrons, and any one perusing the many glowing reports about the efficacy of this drug in phthisis, without allowing the usual discount for enthusiasm, would be forced to conclude that the difficulty of curing the disease was solved. The writer has given it a trial in some cases with negative results. Houzé gave 15 grains three times a day to all the phthisical patients in a Brussels hospital "with excellent results" in all stages of the disease, especially when cavities existed. The balsam of Peru, already mentioned, has occupied the attention of Schnitzler, who finds that if injected into the veins it has a very decidedly curative action. He, therefore, has discarded its administration by the mouth, and gives it by the hypodermic needle in the form of an emulsion with oil and mucilage. It will require many more tempting reports before this method will become a recognized treatment for phthisis.

Great activity has been shown of late in the treatment of pulmonary phthisis by methods which are intended to bring the antiseptic or antiparasitic agents into direct contact with the diseased spots with their contained bacilli. Inhalations, sprays, insufflations, and parenchymatous injections have been tried; but taking all the reports into consideration, though marked temporary improvements have been often recorded, the general results have been disappointing. A few of the more important methods will be briefly summarized.

The inhalation of dry *hot* air has been tried with the view of destroying the bacillus. Renzi uses air at a temperature of 350° F. Others have tried very *cold* air; the results are most disappointing. (The

latter method promises well for hæmoptysis, the former method seems to induce it. Moist warm air has also been used. Dujardin-Beaumetz and others denounce these methods as worthless and positively dangerous, and they may be regarded as now unjustifiable.

Hydrofluoric acid has been much used and some good results have been obtained, but others have denied that it has had any beneficial effects, so that it is needless to describe the method which is carried out by placing the patient in a chamber into which acidified air is pumped until each cubic metre contains ten to twenty litres of the fumes obtained by acting upon fluorspar with H_2SO_4 in a leaden vessel. It does not appear that any harm can result from this treatment, and gains of fourteen and sixteen pounds have been recorded after two months' treatment of one hour each day.

Creasote has been given by inhalation as already mentioned with much benefit, but the method of treating phthisis with antiseptic respirators, which had such a rage after the discovery of the bacillus, is certainly losing ground, and except as an adjunct to other treatment when special complications exist it will cease to be used.

The perforated zinc inhaler, used with persevering care in conjunction with the internal and external or "intensive" method of administering creosote, has given decidedly beneficial results, but how much of the good is owing to the other means of getting the drug into the system is hard to say. Where the fetor of the expectoration is marked there cannot be a doubt that this treatment is most beneficial. A few drops (15 minims) of a solution of creasote in alcohol (1 in 3 or 4) may be sprinkled upon the sponge several times during the day.

Thymol, guaiacol, iodine, carbolic acid, eucalyptus, iodoform, menthol, and various other volatile antiseptics have been used in this way with varying successes.

Robinson's inhaler liquid consists of—

℞.—Iodoformi		gr. xxiv.
Creasoti purif.		♏iv.
Ol. eucalypti		♏viij.
Chloroformi		♏xlviij.
Alcoholis et ætheris	 q. s. ad	ʒiv.—M.

Coghill's liquid consists of—

℞.—Creasoti purif.		ʒj.
Acidi carbolici		ʒij.
Tinct. iod.		ʒij.
Spt. vini rect.		ʒiij.—M.

Iodide of mercury—1 part of iodide of mercury and 1 part iodide of potassium in (5000 to 15,000) water—to be used as a spray, has been extolled as a bacillus exterminator. It has been used in solution of five to ten times this strength.

It is, however, exceedingly doubtful if any of the above solutions ever reach the bacilli in the lung tissue, but it is almost certain that a portion of the dose finds its way into the circulation eventually.

Compressed air is recommended by Forlanini, and oxygen and ozone have been tried, and even nitrogen, diluted with twice as much air, has been administered by Valenzuela, who finds the effects the same as if rarefied air was used, a marked antipyretic action being always observable.

Germain Sée has recently conducted extensive experiments upon the treatment of phthisis by artificial or medicated atmospheres under pressure, and he reports improvement of appetite, gain of weight, diminution of cough and expectoration, and subsidence of fever. His method is carried out by placing the patient in a close chamber for one, two, or three hours, into which air was forced at an increased pressure of about half an atmosphere, after passing through a solution of creasote and eucalyptol.

The oil of pinus pumilio is of great benefit in some cases as a spray or inhalation, or sprinkled over the sponge of an inhaler or respirator.

Parenchymatous or intra-pulmonary injections have been tried in a great number of cases during the past few years, and sometimes with partial success, and sometimes with evil results.

Fernet injects, by a long needle connected with a Pravaz syringe, 3 drops of camphorated naphthol (equal 1 of pure naphthol).

Riva injects into different parts of the lung at one time more than 1 ounce of a 1 : 3000 corrosive sublimate solution. The biniodide is used in the same way, and nearly every known antiseptic has been tried, especially creasote dissolved in eucalyptus oil or liquid vaseline.

Iodoform or iodol are favorite drugs for this purpose, but the writer is content to wait for further evidence of their value before adopting this plan.

D. Walker injects a solution of menthol (12 per cent.) and creasote (2 per cent.) in olive oil into the larynx by passing a curved vulcanite tube through the vocal cords. He reports the usual glowing improvements in early phthisis—*i. e.*, loss of cough and gain in weight—from this practice.

Recently Lannelongue's plan of attacking the bacilli by deep injections of the chloride of zinc has received close attention. (See under Tuberculosis.)

There would appear to be no limit to the daring of some therapeutists. An American physician reports that, observing the absence of phthisis in rheumatic patients, he injected 6 ounces of blood from a rheumatic patient into persons suffering from phthisis. Rheumatism was said to have followed, with great improvement in all the chest symptoms.

Little need be said of the various suggested surgical procedures, as the tapping, washing out, and draining of cavities, or the opening freely into them by bold and free incisions from without, with the view of

applying the cautery or caustics. Such practice must show very different results from those published before interference of this kind comes to be recognized as a justifiable routine treatment in phthisis. The surgical treatment of large superficial basilar cavities is a legitimate undertaking in many cases.

Very recently Tuffier, having satisfied himself that the ordinary surgical procedures limited to the opening and drainage of large tubercular cavities did not exhaust the resources of the operator, was tempted to try resection of the lung in *incipient* phthisis. He made an incision into the second intercostal space, passed his finger over the apex of the lung, found in it a nodule the size of a large hazel-nut, and, after drawing the apex of the lung through the wound, he applied to it a silk ligature tightly, and cut off the diseased portion, suturing the pedicle accurately to the periosteum of the internal surface of the second rib to prevent the danger of pneumothorax. Rapid recovery followed, all dressings being dispensed with upon the ninth day.

The surprising results obtained by surgical treatment in tuberculosis of the peritoneum are noticed under Peritonitis, on page 611.

Koch's method of treating pulmonary phthisis, which has been tried during the past year, is not referred to in this article. The writer has reserved for it a place under the heading of Tuberculosis, which should be read in connection with the present. In that place he ventures to insert a plea for the further trial of the lymph under different dosage regulations, and to protest against the abandonment without further trials of an agent proved to possess such marvellous selective action.

Cantharidinate of potassium, the injection of dog's serum and goat's blood, and other new agents, are also mentioned under Tuberculosis.

Remedial agents for the treatment or relief of some of the more prominent symptoms of phthisis may be mentioned. Cough demands attention in most cases at some stage or other of the affection, but there can scarcely be instanced a greater mistake in medical practice than the routine treatment of pulmonary consumption by cough mixtures. The use of the various expectorants and anodynes which unfortunately constitute the chief portion of the anti-phthisical armamentarium of some physicians only leads to destruction of appetite, injury of digestion, increase of sweating, and all the numerous ills resulting from retained secretion.

In the early stages of phthisis where the incessant, hard, dry, hacking cough interferes with the patient's rest and assists in keeping up the irritation and fever, it is the duty of the physician to administer anodynes in small and oft-repeated doses so as to slightly influence the respiratory centre and check coughing, which is as injurious as it is useless. The saline mixture mentioned upon page 646 will be found to meet the case, and the quantity of morphine may be doubled, and an additional drop of dilute hydrocyanic acid may be often added with advantage to each dose. Mixtures of this sort should be given very sparingly through the day, but they may be administered more freely

during the night. The citrate of potassium formed on adding the lemon juice to the alkali is a valuable expectorant, and where the mucus is tenacious in cases characterized by difficult expectoration, ammonium carbonate to about half the amount of the potassium salt may be substituted.

A teaspoonful of sal volatile in a wineglassful of water, to which a tablespoonful of fresh lemon juice and $\frac{1}{16}$ grain of morphine have been added, is always a perfectly safe combination, and in the dyspnœa of the cavernous stage it may be given to great advantage if the morphine be omitted.

Iodide of potassium with small doses of ipecacuanha wine may be tried after meals.

The various remedies already mentioned as valuable in the constitutional treatment of the disease will be found of great benefit to the cough. Thus, cod-liver oil often relieves it, and creasote is frequently very efficacious at all stages of the affection. Tar and creolin act in the same way. Counter-irritation by small blisters or iodine or Chili paste often helps the cough.

The various inhalations already mentioned may be tried. Indeed, as a rule, everything or every method should be preferred which will give relief to cough without drugging by morphine, chloral, henbane, hemlock, bromides, etc.

Creasote inhalation, as already mentioned, is indicated especially in basilar cavities, or where expectoration is profuse and fetid.

The pinus pumilio is a grateful and efficacious remedy.

Conium with hydrocyanic acid often acts speedily in subduing spasmodic cough when administered in the form of an inhalation.

When the cough is accompanied by pain, or where from pleuritis or pleurodynia each deep inspiration is painful, anodyne liniments, as chloroform and belladonna may be applied under oiled silk or upon spongio-piline, but, as a rule, there is nothing to give the relief which is afforded by fixing the chest wall at the affected spot.

While writing the present article, the writer has been called to relieve a patient in the last stages of the disease, in whom every attempt at coughing was followed by a stabbing, agonizing pain in the chest. Relief was instantly obtained by strapping the affected side of the thorax by long strips of adhesive plaster, passed from the sternal region of the sound side round the pained ribs, and catching firmly upon the opposite side of the vertebral column, so as to immovably fix the affected pleura as in a vice after the method suggested by Roberts.

Poulticing, as a rule, is of little use in such cases, but in local inflammatory complications of superficial extent, it may be often utilized with great advantage for short periods.

Fever or pyrexia is one of the most serious symptoms which the physician will be called upon to contend with in the course of phthisis. Up until comparatively recently he had to content himself with looking on while the patient slowly or quickly burned himself out. Too

often the suffering of the phthisical victim will be found to be measured by his increased temperature, and if this can be reduced and kept within bounds by safe measures, much of the pain, distress, and indescribable weariness which characterize some examples of the disease may be obviated. Quinine is most unreliable, and in doses of large amount often aggravates the patient's discomfort by the unpleasant symptoms of cinchonism, or by the still more undesirable effect of drying up his expectoration and increasing his cough.

The new antipyretics—antipyrine and antifebrin—are blessings of great value in the treatment of the pyrexia of some cases of phthisis. The method which was at first pursued after the introduction of antipyrine was carried out by the writer for three years. It consisted in administering 30 grains of antipyrine, and in one hour giving 15 grains more, and in another hour 15 grains again (60 grains in all), if the temperature had not fallen after the first or second dose. Sometimes a drop of 10° F. was observed, and the temperature was often found not to rise for twenty-four hours after, during which time the greatest relief was experienced of all the distressing symptoms of the disease.

Though the writer never witnessed any alarming results from this large dose in phthisis, other observers have recorded serious collapse and cyanosis, symptoms which he has since observed when *small* doses have been given in other affections.

These untoward effects have led to the drug being administered in smaller doses at frequent intervals, 10 grains being given every four, five, or six hours until the temperature falls. Though the results by this plan are not nearly so definite and satisfactory as when the one large daily dose (60 grains) is given, still, upon the whole, it is more likely to be safer, and hence the older plan is being gradually replaced by the small dose system. Some physicians content themselves by giving a 5 grain tablet every few hours until the temperature begins to fall. The rise in this case soon follows, and the thermometer must be used often, as the physician feels his way and takes soundings before administering further doses of the drug.

Antifebrin may be given in 4 grain doses every four or six hours. It yet remains to be proved that it is safer than antipyrine, and though it will scarcely produce the same certain and speedy fall as is almost invariably found after a very large dose of this latter drug, nevertheless, it appears to have a steadier and more continuous action when given on the small dose system, consequently it will probably be found to better serve the end which the physician has in view in the reduction of fever heat in phthisis. It is also much cheaper.

It is needless to discuss the advantages of these remedies. Though they in no way tend to affect the ultimate end to which the diseased action is slowly or quickly progressing, any one who watches the ease and comfort so frequently following their administration will not withhold them in every case of phthisis. The drawback most likely to cause inconvenience will be excessive perspiration, and in very ad-

vanced stages of the disease, in very weak patients, they should be given cautiously, and in very small doses; 2½ grains of antifebrin often give relief under such circumstances. Other new antipyretics need not be discussed. Since using antipyrine, the writer has never had to employ sponging or to give wet packs for the high temperatures of acute or chronic tuberculosis.

These new agents, it must be remembered, are not suitable remedies to be used in a *purely routine* manner in the treatment of every rise of temperature in chronic phthisis.

Williams does not speak highly of them, and when an agent for the relief of high temperature is needed, he prefers quinine and salicylates. For the pyrexia of the first stages of tuberculosis, he prefers derivate measures, such as counter-irritation and salines.

Where the temperature, however, rises to a height bordering upon hyperpyrexia, in the opinion of the writer, these agents are of little value, and the judicious administration of antipyrine is the best and safest agent available.

Hemoptysis occurring during the course of phthisis will be met by remedies mentioned upon page 311.

Diarrhœa. Under this heading, upon page 190, the various remedial measures useful in the treatment of different kinds of diarrhœa have been enumerated.

There is no special or specific astringent for phthisical diarrhœa. When ulceration of the intestines exists, opium or morphine is indicated, in doses sufficient to quiet peristalsis and relieve pain, and occasionally lead or copper salts may be also indicated, but where a pure astringent action is desired in the chronic diarrhœa of phthisis, the writer avoids the matallic astringents, and selects hæmatoxylon as the least objectionable and most efficacious remedy of this class. It may be given in pill, powder, or mixture, 10 to 15 grains of the dry powdered extract being a moderate dose. Every known astringent and antiseptic remedy has been tried and generally found of some use.

Beta-naphthol, hydro-naphthol, and small doses of hydrarg. bichlor. are advocated.

One creasote capsule after each motion sometimes acts like a charm.

Lactic acid has recently been found of greatest service by some observers, and talc is used by others. (See under Diarrhœa, page 189.)

Under Peritonitis will be detailed the recent extraordinary results of treating abdominal tuberculosis by laparotomy.

Night sweating. The old-fashioned pill is still regarded as one of the best remedies. It may be given at bed-time, or oftener if required.

℞.—Zinci oxidi gr. iijss.
Ext. belladonnæ gr. ½.
Ext. hyoscyami gr. ijss.—M.

Make twenty-four of these.

S.—One pill to be taken at bed-hour.

Belladonna or atropine seldom fails to relieve the sweating, but the dryness of the throat and the effects upon the expectoration and the heart often prevent its being used in such doses as give reliable results. One minim of the solution of atropine (1 : 100), representing $\frac{1}{100}$ grain, very generally checks sweating in phthisis, or 10 minims of the tincture of belladonna may be given in the evening, and 3 minims every two, three, or four hours afterward, may be safely administered. Occasionally belladonna and atropine fail.

Agaricine possesses very marked influence in checking the night sweats of phthisis, as first pointed out by Murrell. No disadvantages follow its action, and in some cases it affords relief when every other drug fails. There is much confusion about the dose, as the different samples of the drug differ considerably in strength. One-eighth grain of the white crystalline powder may be given every four hours in very severe cases. Often one dose acts like magic, and repetition may not be needed for a considerable time.

It may be given alone, in aromatic sulphuric acid, or with Dover's powder.

Klemperer gives $\frac{1}{6}$ grain of agaric acid in pill in the early evening.

Hyoscine in minute doses, $\frac{1}{250}$ grain, hypodermically, gives good results.

Dover's powder in 1 grain doses is used by some, but it is very uncertain.

Picrotoxin, $\frac{1}{150}$ grain, often acts most beneficially, and strychnine occasionally succeeds.

Quinine in 3 to 6 grain doses may be tried.

Arsenic in small repeated doses occasionally answers well.

Muscarin, $\frac{1}{2}$ grain, hypodermically, checks phthisical sweating, and it may be also given by the mouth.

Sulphonal, in addition to its hypnotic properties, may be very often found to give excellent results in this complication. The writer has used it with great satisfaction in doses of 6 to 8 grains, but in one very advanced case at present under his notice it has not only failed, but the patient insists that upon every occasion of its administration the sweating becomes more profuse and exhausting. This is, however, a most exceptional result.

Phosphate of calcium in 8 to 12 grain doses has sometimes given good results, as it may check both sweating and diarrhœa.

Tannic and gallic acids, sulphuric acid, sulphate of iron, ergot, alum, and many other drugs have sometimes proved useful.

Tellurate of sodium, in doses of $\frac{2}{3}$ grain, in pill, once a day, has recently given excellent results, but the most objectionable garlic odor given to the breath is a barrier to its use.

Sponging the body over with vinegar or vinegar and water generally affords some relief, and belladonna may be used in the same way with advantage. Chloral, 2 drachms, dissolved in a tumblerful of brandy and water, has been found very useful when sponged over the body.

Very hot water often acts promptly when used in the same way, as does solution of alum.

Rossenbach reports encouraging success after the application of an ice-bag over the abdomen for several hours during the night, in cases where other remedies fail.

Laryngeal symptoms are to be met by the remedies mentioned upon page 440 for laryngeal phthisis.

Peritoneal complications are referred to under the treatment of Tubercular Peritonitis, on page 611.

PITYRIASIS RUBRA OR EXFOLIATIVE DERMATITIS.

The treatment of this very formidable affection is not so hopeless as Hebra's opinion would lead one to expect, the writer in a limited experience having seen at least three cases, closely agreeing with Hebra's description of the disease, which completely recovered under appropriate treatment. Internal remedies do not appear to exercise much influence, and in the successful cases it is very doubtful if they have contributed much to the result. After trying most of the reputed remedial agents, the writer is inclined to believe that if any good is be obtained from drugs internally it will be furnished by small doses of arsenic in combination with a diaphoretic and diuretic, as in the following:

℞.—Liq. ammon. acetat. ℥iij.
Potassii acetatis ʒij.
Liq. Fowleri ♏ xxxv.
Aquæ camph. ad ℥x.—M.

S.—A tablespoonful after meals three times daily, in water.

Cod-liver oil and iron at a later stage are also probably useful.

Local treatment will undoubtedly do much if conscientiously and patiently carried out, the chief indication being to protect the affected part (the entire cutaneous covering of the body) from the irritation produced by contact with the air and variations in temperature. Special symptoms will call for endless modifications of details. A weak alkaline bath, containing starch or a little carbolic acid, may be permitted for one or two hours daily where itching is very troublesome. Most reliance is to be placed in inunctions by an animal or vegetable fat. These should be carried out several times daily by an experienced hospital nurse told off for the purpose. Fresh lard, deprived of every trace of saline matter, answers the purpose well. About 2 ounces of the simple liniment of camphor may be added to each pound of the fat, and in summer suet may be also added. This may be rubbed in gently and patiently, after the scales have been removed by prolonged immersion in the warm bath or by very gentle friction with a soft, rough cotton towel. Zinc ointment, to which 5 or 10 per cent. of the camphorated oil has been added, is to be then

smeared over the limbs, which should be covered with lint or old linen, also well coated over with the ointment, and comfortably bandaged; the body being several times annointed with the lard during the day, while the limbs and face need be only dressed morning and night with the ointment. Cod-liver oil, and olive or almond oils, may be also used. Some cases have been successfully treated by causing the patient to live in a warm bath for many days or even weeks at a time.

PITYRIASIS VERSICOLOR.

Pityriasis versicolor, being a harmless parasitic affection, only slightly, if at all, contagious, its treatment is seldom demanded by the patient, who, as a rule, is scarcely conscious of its existence.

Almost any parasitic remedy speedily removes the discoloration, and the physician can use any antiseptic solution which pleases his fancy. The most elegant will be:

℞.—Hydrarg. chlor. corros. gr. xv.
Ammon. chlor. gr. xv.
Spt. lavandulæ ʒvj.
Mist. amygdalæ ad ℥x.—M.

S.—To be freely sponged over the discolored spots every night.

Carbolic lotion or a strong carbolic soap will remove it. In phthisical patients the affection is common, and is sometimes entirely removed by the application of iodine which is used for purposes of counter-irritation, or by eucalyptus or creasote ointments applied with other objects in view.

Sulphites, or sulphides, or sulphurous acid solution (1 : 5), are speedy and cleanly.

PLACENTA PRÆVIA.

Though a description of the various operative measures which may be demanded at the puerperal period is outside the scope of the present volume, a brief reference to the treatment of this formidable abnormal condition may be here inserted.

The management of the case will depend, to a very large extent, upon the term of the pregnancy, duration, and extent of hemorrhage, etc.

In the earlier months (before the seventh), where the hemorrhage calls attention to the condition and the diagnosis is clear, the treatment of the case will be pretty much like that of an abortion. Absolute rest upon a hard bed in a cool room, with the usual precautions indicated under Abortion, may tide the patient over the period when the viability of the child may be naturally expected. This expectant plan is, however, only justifiable when the hemorrhage is very small,

and the onset of severe bleeding, which may demand immediate action, is always to be arranged for.

When this profuse hemorrhage occurs, the rule should be observed that delivery is to be accomplished at the earliest possible moment. If the os be small and not dilated to any considerable extent, notwithstanding the adverse opinion of many authorities, the practioner is justified, if the waters have not come away, in carefully plugging the vagina by the method mentioned upon page 11. This as a temporary expedient will serve many purposes. It will stop the hemorrhage for a time, during which the physician can arrange for the assistance which he requires. It will in some cases enable him to put an exhausted and anæmic patient into a better condition to bear the shock of a rapid delivery, and it will probably excite the uterus to better contraction. Spiegelberg disapproves of the method of plugging by rubber bags in this condition, and he advises the introduction, of a disinfected sponge or a laminaria tent before inserting the vaginal tampons, "if the cervix be far from dilated." He objects to the plan of Hick's version being employed when the cervix is unprepared for it. The same objection also maintains against rupturing the membranes under similar circumstances. If the os is already dilated to any extent when the patient comes under notice, or if the os is found dilated after the removal of the plugs, the course is then the same in both cases, and does not admit of any question. It is *to turn and deliver as quickly as possible.* The operator introduces his hand through the os by the *side of* and *not through* the placenta, proceeding in the direction in which he feels the adhesions to be the least extensive, avoiding, as far as possible, rupture of the membranes as he carries his hand high up into the uterus between its wall and the membranes, until the feet are grasped and brought down, when delivery may be accomplished in the ordinary way. The extent of the hemorrhage must not be permitted for a moment to paralyze or unduly hasten the operator's efforts. With the feet grasped in the uterus, the forearm of the physician acts as a plug, and generally stops the hemorrhage; and at this moment he may safely rest for a brief period before proceeding further, so as to be prepared for the gush of blood which generally accompanies the descent of his hand and arm.

Obermann lays stress upon the importance of massage of the body of the uterus during the process of extraction, which should be most deliberate.

The following rules are laid down by Braxton Hicks for the management of placenta prævia, and are of such importance as to warrant their reproduction here:

1. After diagnosis of placenta prævia is made, proceed as early as possible to terminate pregnancy.

2. When once we have commenced to act, we are to remain by our patient.

3. If the os be fully expanded and the placenta marginal, we

rupture the membranes and wait to see if the head is soon pushed by the pains into the os.

4. If there be any slowness or hesitation in this respect, then employ forceps or version.

5. If the os be small and placenta more or less over it, the placenta is to be carefully detached from around the os. If no further bleeding occur, we may elect to wait an hour or two, but should the os not expand, and if dilating bags are at hand, the os may be dilated. If it appears the forceps can be admitted easily, they may be used, but if not, version by combined external and internal method should be employed, and the os plugged by the leg or breech of the fœtus; after this is done, the case may be left to nature, with gentle assistance, as in footling and breech cases.

6. If the os be small, and if we have neither forceps nor dilating bags, then combined version should be resorted to, leaving the rest to nature, gently assisted.

7. If during any of the above manœuvres, sharp bleeding should come, it is best to turn by the combined method in order to plug with the breech.

8. Where the hemorrhage occurs before the end of the seventh month, version by the combined method, no force following, is the best plan.

To these I may add, however, if we employ a routine method in all cases, it will be found that the version by combined method, on force following, gives a result as good, if not better, than any. The after-treatment must be conducted on modern principles. Should oozing occur after the expulsion of the placenta, the swabbing of the lower uterus by styptics will be easy; and inasmuch as the outlet of the uterus is liable more especially to be blocked by adherent clots, it will be wise to irrigate the cavity daily with some antiseptic solution, or to insert iodoform pessaries into the vagina, particularly if the irrigation cannot be done.

PLEURITIS, Acute.

Acute inflammation of the pleura is to be met by the measures already pointed out as beneficial in the treatment of other inflammations. The most prominent symptom, and the one calling out most loudly for relief, is pain. This should be promptly met by morphine or opium, and these agents act beneficially in other ways than simply by giving relief to the patient's suffering. If the case is seen from the first onset of the disease, when the pain in respiration or in coughing is very severe, a hypodermic injection of $\frac{1}{3}$ grain of morphine may be administered in the region of the pained pleura. This may not be repeated unless under exceptional circumstances, as the best effects of opium in the inflammation of serous membranes will be obtained by oft-repeated small doses by the mouth. With the opium should be combined remedies which will have some effect in subduing the fever,

by acting upon the skin and quieting the circulation. Even at the very onset the writer has used the new antipyretics with great benefit where the constitutional disturbance and fever heat chanced to be very high. This, however, is not frequently the case, and the best routine treatment at this stage will be found in a simple diaphoretic combined with the anodyne, as in the following:

℞.—Morphinæ hydrochlor. gr. j.
Tinct. veratri vir. ♏viij.
Liq. ammon. acetat. ℥ijss.
Vin. antimonii ℥ijss.
Aquæ camph. ad ℥viij.—M.

S.—One tablespoonful to be taken every third hour.

The exhibition of opium is not the only measure to be relied upon for the relief of pain.

General blood-letting is unfortunately now seldom used. In *severe* cases it may save life, and anyone who, like the writer, has seen it afford marked and speedy relief with amelioration of every symptom will not readily be seduced into the present prevailing belief in its inefficacy. When the urgency of the pain and dyspnœa warrant the letting out of blood, a large opening should be made in a fair sized vein, 12 ounces, or even a pint of blood, may be allowed to freely flow, and instant relief may follow.

Leeching, though acknowledged to be less efficacious, is much more frequently practised. Ten leeches may be placed over the affected side, and if the patient has sufficient adipose covering over his ribs there cannot be a doubt about the advisability of putting one or two cupping glasses over the bites and extracting more blood. In thin patients this can be accomplished by hot fomentations. The action of the leeching may be intensified by the administration of a large saline purgative. The writer is by no means satisfied that leeching is of much use, and given a case where the extraction of blood is considered to be necessary by the urgency of the dyspnœa and other distress, he thinks that it will be safer to open a vein.

Poulticing is the old-fashioned and still popular method of relieving the pain of acute pleuritis, and hot linseed cataplasms applied frequently afford the safest and least objectionable routine plan of treating mild cases of the disease where blood-letting and leeching are contra-indicated. The first poultice may contain half its weight of mustard, and the subsequent ones may be entirely of linseed meal, or the ingenious plan mentioned on page 608 may be adopted. Poulticing may be advantageously stopped as soon as pain subsides. Cold applications, compresses, Leiter's tubes, or ice bags have been suggested and used instead of poulticing or hot fomentation. There is not sufficient evidence of the value of this innovation to justify one in recommending it as a routine practice, but enough proof of its occasional usefulness

has been demonstrated to warrant one in readily adopting it when warm or hot applications fail to afford relief.

Blistering the chest for the relief of pain in the early stages of acute pleuritis has still many advocates. Fagge maintained that it appeared to him more serviceable than any other measure; it is often undoubtedly of much service during all the stages of the disease from its onset until the absorption of the last remnants of effused fluid.

The blistering unfortunately interferes with the next remedial measure for the relief of pain, though leeching and poulticing do not do so necessarily.

Strapping of the affected side of the chest by means of stout strips of adhesive plaster, starting from the front of the chest on the sound side of the sternum, and ending upon the sound side beyond the spine, after enveloping the pained side firmly as in a vice, while the patient expires as forcibly as possible. This prevents the use of the affected lung and pleura to a great extent, and not only is pain relieved at once, but the rest is most beneficial as in the treatment of every other inflammation, and this method often appears to cut short the duration of the attack and the amount of effusion. A bandage three or four inches wide may also be used to relieve pain when applied tightly around the chest. This is known as Otto's method, and it is often valuable.

The hypodermic injection of cocaine ($\frac{1}{2}$ to 1 grain) over the seat of the pain has given relief. As a rule, in acute pleuritis, little satisfaction may be expected from anodyne liniments as belladonna, chloroform, etc.

During the time that these local remedies are being exhibited the morphine mixture, with the veratrum and antimonial wine, should be continued until the absence of pain and the subsidence of the fever call for its discontinuance.

Up to this time the patient should be maintained in a position of absolute rest in bed, and this must be continued until the daily physical exploration of the chest proves that the effusion has ceased to increase, or as long as the amount of fluid remains considerable.

Diet is to be of the simplest, solid food being prohibited, milk and farinacious foods being the chief part of the diet.

Purgative are not called for, except at the earliest and during the later stages, and alcoholic stimulants are seldom indicated until the disease passes into a chronic form. As the effusion increases there seems to be *some* chance that by diminishing the amount of liquid consumed the effusion may be held in check. If this is true it must only be to a very limited extent.

For all practical purposes the question now becomes one of the treatment of the *result* of the pleuritis, or, in other words, of the treatment of effusion within the pleura. The first point for settlement is whether the case is one for surgical or medical treatment. If the effusion is moderate in amount, and does not by its quantity threaten seriously to embarrass the heart, and to impede respiration, there can be no doubt

that the physician is justified in waiting to see if absorption will commence. Remedies of considerable power in hastening this should now be tried. Locally and constitutionally the effusion may be attacked.

Blistering is often very successful, and one large cantharidine plaster may be applied to the centre of the affected side of the thorax, where it may be permitted to remain for eight or ten hours, until thorough vesication results. As a rule, the plan of applying several small blisters for three or four hours each to different parts of the chest gives better results. These flying blisters may be made about three inches long and two and one-half inches broad, and may be placed upon different parts of the chest wall at the same time. The simplest way, however, is to use *one* blister, which should be kept on for, say, two hours near to the lower margin of the diaphragm. It may then be placed six inches higher up, and allowed to remain in contact with the skin for three or four hours, after which time it may be applied somewhere near to the level of the upper limit of the effusion for six or eight hours.

Sometimes the effect of this treatment is quite striking, and occasionally rapid diminution in the amount of fluid may be dated from the time of trying the blisters. It is generally useless if tried while the amount of fluid is steadily increasing.

Iodine tincture is a counter-irritant, or equal parts of tincture of iodine and glycerin painted on with the view of being absorbed, may be tried. Every known counter-irritant has been used, and occasionally with success. The iodine is, perhaps, the best of the class.

Mercurial ointment (1 in 6 or 8) may be freely rubbed into the chest-wall, taking care that salivation does not follow from too long protracted use of the remedy. If any improvement is to be got from its application, signs should show themselves during the first two or three days after its being used. The oleate of mercury may be used, or excellent results may be obtained from applying a dilute mercurial ointment, or oleate of mercury ointment upon lint, and applying strapping over this, as by Roberts's plan. In this way the liniment of iodide of potassium and soap (B. P.) may be used sometimes to great advantage.

Internal remedies consist of absorbents like iodides, diuretics like caffeine and digitalis, purgatives of the saline class as sulphate of magnesia, and diaphoretics like large doses of jaborandi or pilocarpine.

Some of these agents can be tried together. Thus, the following is a combination of value:

℞.—Tinct. digitalis ℥iv.
Tinct. scillæ ℥iij.
Potassii iodidi ℥ij.
Decocti scoparii ad ℥x.—M.

S.—One tablespoonful to be taken in half a wineglassful of water after meals thrice daily.

Pilocarpine, to be of use, must be given in such doses as will cause most profuse sweating ($\frac{1}{4}$ grain hypodermically), or one drachm of the fluid extract of pilocarpus.

The first may now be changed to one in which the least possible amount of fluid is allowed, meat, biscuit, stale bread, or old cheese being only permitted for the first three days, a tumblerful of fluid being swallowed on the third day. Some authorities speak highly of a liberal diet of milk—five or six pints daily. All the above internal measures may be tried; but, as a rule, they are uncertain and disappointing, and should not be too long administered. The best results are obtained from giving salines according to Hay's method (see 5th edition of the author's work on *Materia Medica and Therapeutics*, page 451). After fasting, 1 ounce of sulphate of magnesia dissolved in the smallest quantity of hot water may be administered the first thing in the morning. Half this dose may be ordered twice a day for weak patients, and twice this amount may be given to strong plethoric ones. P. B. Smith records several cases successfully treated by smaller doses employed in this way, with a dry diet.

Salicylate of sodium in full doses (30 grains), and salol (30 grains) four times daily are said to have a specific action over the effusion; but the most glowing accounts of the remarkable effects of antipyrine in moderate doses (10 grains every four or six hours) have been recently published. The writer has not yet had an opportunity of testing the action of this drug over the effusion. Though he has used antipyrine in the early stages of the affection for the relief of pain and fever, he had not noticed any specific effect upon the effusion.

These measures, as already hinted at, are only warranted when the amount of fluid is not very extensive, nor are they to be used for any length of time, even when the amount of fluid is moderate, say 20 to 40 ounces. Delay in the removal of the fluid means great risk to the lung, which is less likely to ultimately expand in proportion to the length of time during which it has been compressed by the fluid. Hence, when several weeks have elapsed with a moderate quantity of effusion in the pleura, though there be little inconvenience, and but slight displacement of organs, the fluid should be drawn off. Where the pleura is even filled only up to the angle of the scapula, and no symptoms whatever indicate to the patient that there is anything wrong, it is laid down that the fluid should be drawn off if it has resisted treatment for more than four weeks.

If the patient be found to have the whole of the pleural cavity full when first seen, or to have both cavities half full, operation should not be delayed for the sake of trying the effects of drugs. Sudden death has been repeatedly noted when one cavity has been full, though no symptoms of pulmonary or cardiac distress were present to warn the physician of the impending catastrophe. Therefore, if in doubt, the best course is to decide upon immediate tapping.

Various rules have been formulated for the guidance of the physician

as to when operation or waiting is to be decided upon. Some authorities are influenced much by the symptoms of embarrassment of the breathing, others by the displacement of organs, others by the duration of the effusion, etc., but the error that generally underlies all these conclusions will be found to be that the simple operation of tapping is too often regarded as the last resource, only to be used when all others fail.

The physician who decides upon purging, blistering, or diuretics in a case where dullness extends almost to the clavicle, will *generally* have his pains rewarded by the ultimate absorption of the effused fluid, but occasionally, though rarely, he may have the mortification of finding that his patient has been suddenly called to his long rest. More frequently will he experience that a tardy convalescence, with a partially collapsed lung and shrunken chest wall will remain as a monument of his patience and faith in drugs.

Procrastination often arises from some uncertainty in the diagnosis. This should never be. If the physician is in doubt, the ordinary hypodermic syringe and needle will easily give him the required confidence. Already the way that this instrument may be utilized for exploratory purposes has been described. It should be thoroughly sterilized by immersion in some antiseptic liquid, and the cylinder being half filled with *weak* carbolic or corrosive sublimate solution, the instrument is held vertically while the piston is screwed home by a few turns, so as to fill the needle with the solution down to its extreme point. It is then plunged into an intercostal space deeply, and if the pleuritic fluid does not flow into the cylinder upon screwing out the piston, a few drops of the solution may be injected so as to clear the needle of any plug of fibrin or coagulated blood, after which the reversal of the screw will draw up a fair sample of the liquid out of the pleura. It may be a tax upon the credulity of the reader to be told that after withdrawing a dozen minims of the effusion such a change is sometimes set up in the pleura, and its contents as sometimes leads to a speedy absorption of the remainder, yet the writer has observed this many times in hospital practice when the puncture has been made as a demonstration of physical diagnosis in old long-standing effusions. Such a result, however, is not to be counted upon where tapping is indicated in acute cases or where there is much liquid.

The hypodermic needle may be inserted anywhere, but, as a rule, it will be best to introduce it at the spot where tapping is to be performed, as then the physician will be more confident in the introduction of his trochar and canula. If fluid is present he will so certainly find it that there is little fear of a negative result embarassing his future action, but cases have been reported where no fluid entered the syringe, though a larger instrument was successfully employed immediately afterward at the same spot. The writer is inclined to believe that this only occurs when an empty hypodermic syringe is employed. The spot to be selected for puncturing the pleura in paracentesis thoracis is

not of very vital importance. Several situations have been recommended. The usual site is in the axillary line in the fourth interspace (*i. e.*, above the margin of the fifth rib) upon the right side, and in the fifth space (*i. e.* above the margin of the sixth rib) upon the left side. Bowditch advises the puncture to be made between the ninth and eleventh ribs. It is advisable to keep close to the upper border of the rib in order to avoid the intercostal artery or to puncture fair in the centre of the intercostal space. Other authorities, while keeping to the fourth and fifth spaces, select a spot in front of the axillary line, while some puncture at a short distance in front of the posterior fold of the axilla.

The most prominent or bulging space in any of these localities may be safely selected, and any spot should be avoided where there is reason to believe that the pleura is much thickened.

The best form of instrument has already been discussed and described when detailing the treatment of empyema upon page 235, and there is no necessity for repeating the details here.

Upon the whole the unequal suction force of the best aspirators is often a barrier to their usefulness in this operation and where the syphon principle is not considered satisfactory in any case, the writer employs Dieulafoy's aspirator, but after the fluid has commenced to run he does not exhaust the cylinder after emptying it each time, but slowly and patiently withdraws the piston and allows the fluid to flow in at a uniform and steady rate. The flow is too rapid when the piston is drawn up to the top of the cylinder and the stopcock turned fully on.

In chronic cases with large effusions as in malignant disease of the pleura, the writer has inserted a Southey's trochar and canula, and after withdrawing the trochar, a fine rubber tube being attached to the canula, the fluid is allowed to flow into a basin under the patient's bed containing some carbolic lotion, the end of the rubber tube being kept under the surface of the liquid.

Of course, the great object of the operator should be to evacuate the fluid without admitting air. The writer in one case found that air was admitted owing to the struggles of the patient—a very nervous child; an excellent and rapid recovery ensued without a bad symptom.

It is generally not advisable to remove all the fluid in the pleura, but the writer finds that the slowly flowing capillary stream from a Southey's canula may be safely permitted to run until the cavity empties itself. It is different with the quickly acting aspirator, and as a rule, the quicker the flow the greater is the danger of syncope, coughing, or dyspnœa. Should such symptoms supervene the suction must be discontinued for a time without withdrawing the needle or canula, and as soon as marked embarrassment supervenes, the operator had better withdraw the canula and trust to nature for the absorption of the remaining fluid which always happens.

After withdrawing the canula, a small pad of lint, soaked in any antiseptic liquid, may be quickly placed upon the site of puncture, where it can be fastened by a few strips of adhesive plaster. Coughing, if it continues, may be relieved by a hypodermic injection of morphine, or by tightly bandaging the chest with a deep or broad binder.

After the operation is concluded the organs, which had been displaced, may be found partially restoree to their normal position, and day by day the physical signs become nearer to the normal. Sometimes a second or a third tapping may be required. Should pus be found at the first time of withdrawing the fluid, or at any subsequent time, the treatment described under empyema on page 235 will then be considered advisable. The utmost care must be taken to prevent an ordinary pleural effusion from being converted into a purulent one. This may be caused by the use of soiled instruments or by the admission of air during the tapping.

Sometimes a thickened pleura or a large deposit of lymph may give rise to difficulties in getting out the fluid. The latter may be pushed in front of the trochar or canula, but the experienced operator after he has punctured the skin by the instrument takes a short grip of the latter as he causes it to penetrate the remaining tissues with a sudden push or jerk, which is certain to penetrate instead of pushing the membrane before it.

When the canula gets blocked there is some danger in attempting to clear it, The writer has driven out plugs of fibrin by forcing back some of the fluid out of the aspirator cylinder, but this should not be attempted unless the instrument has previously been rendered aseptic both inside and out, and only when the fittings are *absolutely* air-tight.

The canula with stop-cock, mentioned under Empyema, admits of being easily cleared of obstructions by pushing back the trochar without the possibility of air being admitted at the same time, and this is a great advantage.

Where localized or circumscribed collections of pus are found each cavity may require to be separately punctured and tapped.

Professor Lewsaschew has introduced a method of treating pleuritic effusion which appears to be a distinct advance, and it can be used also in purulent cases. Its object is to do away with the untoward results which sometimes occur from the disturbance of the balance of intra-thoracic pressure. He withdraws a small amount of the fluid until some uneasiness is felt by the patient, and then he injects, by a reversed action of the aspirator or syphon, an equal amount of a sterilized solution of chloride of sodium (0.7 per cent. in distilled water.) After the balance is thus restored he continues the aspiration for a time, and again reverses the action injecting in more saline solution until little but pure solution is left behind. Where no adhesions exist this method gives excellent results in pleurisy and empyema.

The diet after tapping should be of the most sustaining nature, and

every remedial agent calculated to improve the general nutrition should be given, as tonics with iron, quinine, and cod-liver oil, change of scene, etc. Where a tendency to re-accumulation occurs, and when the residual fluid after partial emptying of the pleura appears slow in disappearing, the treatment already mentioned must be persisted in, as blistering or counter-irritation, iodides, and diuretics, with saline purgatives like Friedrichshall, Carlsbad salts, or Hunyadi Janos water.

Chronic dry pleurisy is best relieved by blisters or strapping,

PLEURODYNIA.

The treatment of this affection will consist in the exhibition of the remedies suitable for muscular rheumatism. In acute cases one or two full doses of salicylate of sodium (30 grains) given after a hot pack, or a Turkish or hot air bath often act very speedily.

After making an impression upon the pain in this way, the effect may be kept up by smaller doses or by 8 or 10 grain doses of antipyrine every six or eight hours. Salol, in doses of 15 to 20 grains, is a most trustworthy remedy. After the acute symptoms have subsided, or in chronic cases from the first, alkalies in full doses, in conjunction with the iodide of sodium or of potassium should be given.

℞.—Sodii iodidi ℥ij.
Potassii bicarb. ℥j.
Tinct. cimicifugæ ℥vj.
Aquæ camph. ad ℥xij.—M.

S.—A tablespoonful to be taken three times a day after meals.

Quinine, though highly recommended, has seldom been of any use in the writer's hands, but in very chronic cases arsenic is valuable when given in combination with iron in anæmic subjects.

Local treatment is of greatest service. If the pain is unbearable the speediest remedy will be a hypodermic injection of morphine ($\frac{1}{3}$ grain) given directly over the pained region, and if the patient must move about his business the chest should be strapped by Otto's method so as to entirely restrain the movements of the affected side. This generally affords instant relief if properly done. Belladonna and opium plaster may be used for the strapping. Any of the various anodyne liniments may be useful. Thus a piece of lint saturated in a mixture of equal parts of tincture of aconite and of liniments of belladonna and chloroform, may be laid upon the part and covered over with oiled silk and a bandage. Menthol, or chloral and camphor, may be rubbed over the part.

Cupping, blistering, or smart counter-irritation with iodine, mustard, croton oil, Chilli paste, or tartar emetic ointment, may be used. The continuous current or static electricity is often very useful. In severe cases acupuncture after freezing with the ether spray may be tried.

PLEURO-PNEUMONIA—See under Pneumonia.

PLUMBISM.

The treatment of acute poisoning by the salts of lead will be stated under the head of Poisons. In chronic lead poisoning the patient should be persuaded to give up his occupation for a time, if it be clear that the lead got into his system in this way. Minute examination of the patient and his surroundings should be made to determine the source of contamination, and this should, of course, be stopped at once. The symptoms may require immediate relief. Thus the violent pain of lead colic must be relieved by a hypodermic injection of morphine, but no permanent relief can be counted upon until free purgation is established. Two drugs give excellent results—sulphate of magnesia and castor oil. When very obstinate constipation exists, 1 ounce of castor oil, in combination with ½ minim of croton oil, may be given. For prolonged use the sulphate of magnesia, in small morning doses, is to be preferred.

Iodide of potassium is of the greatest value. It forms a soluble salt with the lead in the system, and this appears after a time in the urine. It may be given in any form, and often acts best when combined with the saline purgative just mentioned. Five grains of the iodide may be given three times a day after meals, and 1 drachm of the sulphate of magnesia, three times daily, before meals.

Alum is also of use, and, combined with opium, it often is found to purge gently in painter's colic.

Sulphur baths, or baths of the soluble sulphides or sulphurets, are recommended, but there is room for doubting their usefulness. Sulphur internally is beneficial.

The rectal injection of the vapor of ether has been found useful in the treatment of lead colic.

For the elimination of the poison, Semmola has recently obtained excellent results, and these have also been corroborated by other experimenters. He placed the patient in an acidulated bath, and laid one pole of the continuous current upon the tongue, while the other pole was dropped into the water. Though no lead was found upon the sides of the bath or in the water, the urine was found some days afterward to show that increased elimination was taking place. The bath was then dispensed with in other cases, and one pole was placed upon the tongue, and the other upon the pit of the stomach, or one pole over the vertebral column, and the other over the stomach. In all cases the urine showed increased amounts of lead, and the blue line disappeared in about three weeks, except in those cases where saturnine encephalic symptoms were present.

Electricity is the remedy for local paralytic lesions, and it may be used with advantage even when no paralysis is observable, but where the reaction of degeneration is present. The continuous current may be applied to the affected muscles and to the nerves supplying them.

The induced current may be also occasionally used. This treatment should be patiently persisted in for long periods. Massage may be tried in conjunction with it, and the results just mentioned as obtained by Semmola suggest that the beneficial effects of the current may be possibly owing to the increased elimination. Erb has suggested galvanization of the spinal cord, which probably would be beneficial in the same way. (See also under Colic, on page 132, and under Paralysis, on page 578.)

The prophylactic treatment of all persons subjected to the action of lead is of the utmost importance. The most rigid attention to personal cleanliness is essential. Painters who never eat in their paint shops, and who always carefully wash their hands before meal times, escape, while their less scrupulously clean companions suffer. Where the dry dust of any lead compounds saturate the air of workrooms or manufactories, the workers should be educated to keep their mouths closed, and do all the breathing through the nose, or respirators should be worn, and the freest possible ventilation be insisted upon.

Lemonade made in the ordinary way, but containing free sulphuric instead of citric or tartaric acid, has been found useful, or the acid may be administered in conjunction with a morning dose of sulphate of magnesia in very dilute solution.

PNEUMONIA.

There is much that is most unsatisfactory in the present aspect of the treatment of pneumonia. Mild cases of the disease do well with almost any treatment, but there are grave differences of opinion regarding the best methods of dealing with the worse forms of the disease.

The writer believes that what is at present called pneumonia is but a local or secondary manifestation of several totally distinct constitutional affections which we are not yet able to differentiate. The first satisfactory progress in the treatment of pneumonia will begin after the natures of these separate affections have been demonstrated. For the present the physician must be content to treat pneumonia upon the same rational lines as are indicated in the management of the continued fevers, with such modifications as the extent, nature, and severity of the local pulmonary lesion will suggest, taking care to steer his way clearly between the warm bed and peppermint water treatment, and the heroic calomel, blood-letting, or alcoholic plans.

In the very early stage the patient is, of course, to be put to bed, to have a moderate amount of clothing, and an abundance of fresh, pure air of an equable temperature—say about 60° F.—and a milk diet.

The popular idea of the danger of draughts should compel the physician to superintend the ventilation and heating of the sick room. The writer would urge that a few screens, covered with light muslin, and about six feet in height, should be placed at a little distance around the patient's bed, which must not be in a corner of a room.

With such a contrivance as this, doors, windows, and ventilators may be safely left freely open, even in moderately cold weather.

The most that should be attempted in the way of drugs should be the administration of a mild saline cathartic alone or preceded by 3 grains of calomel. When the bowels have been thus cleared out, the hot skin may be made to act, the cough may be soothed, and the pain in the chest relieved by a simple combination like the following:

℞.—Morphinæ hydrochlor. gr. ½.
Liq. ammon. acetat ℥ij.
Vini antimonii ♏lv.
Aquæ camph. q.s. ad ℥viij.—M.

S.—One tablespoonful to be taken every four hours.

With the administration of the above, large, hot, linseed poultices may be applied every three or four hours. It is best to redden the skin well at the start by mustard, and to keep up the effect afterward by plain linseed, or the plan of combining a pure mustard and simple linseed poultice, as mentioned upon page 608, may be adopted. The poultices should be spread upon flannel, and should extend from the spine to the sternum of the affected side.

Where these simple measures fail to relieve the pain in the chest, a a larger dose of morphine may be given hypodermically, but though this pain is probably owing to some pleuritis which it constantly present in pneumonia, the same freedom in the use of anodynes is not admissible, owing to the danger of interfering with the expectoration and its evacuation. With care, however, pain at this stage can generally be kept in check or almost entirely relieved by opiates.

Hot fomentations (to which any of the innumerable anodyne liniments can be added), cupping, blistering, and leeching may be considered necessary. A method used by Goodhart and Fieandt with marked success consists in applying continuously a large rubber ice-bag over the affected lung. After several hours of this application, pain may disappear, cough may lessen, and very often a marked fall in the fever heat takes place, so much so that many Continental physicians use the ice-bag as an antipyretic. Cold compresses may be tried as a sort of compromise between this treatment and that by hot poulticing or fomentations.

Formerly blood-letting was freely practised for the relief of pain and with the view of cutting short the disease. There cannot be a doubt that as a routine method this raised the death-rate, and it is very probable that many patients died from the heroic blood-letting who would have lived had nothing whatever been done for them. Nevertheless, it is just as likely that some few patients nowadays are permitted to die for want of blood-letting. With a firm, incompressible pulse in a strong plethoric subject who is suffering from *dyspnœa*, or much pulmonary embarrassment and *lividity*, blood-

letting may still be relied upon to turn the scale in the patient's favor.

Leeching will not accomplish this. This slow method of removing a small amount of blood will not produce any marked benefit in severe cases, though it may relieve local pain, but in conjunction with a smart saline purge and the application of one or more cupping glasses over the leech-bites a good effect has been several times obtained by the writer.

Some authorities maintain that at this early stage of the disease it may be rendered abortive by large doses of quinine (30 grains), calomel (10 grains), by very cold baths, and other measures. This is so unlikely, and at constant variance with experience, that when abortion does take place most observers will conclude that it was either a mistake in diagnosis or a natural freak of the disease.

The temperature should be watched closely, and when, say 104 or more degrees are recorded, it will be wise to consider what is to be done to reduce it. Various measures are feasible. The writer prefers antipyrine in moderate doses—say 10 grains every four or six hours. This is comparatively safe, and, when used with discrimination and the effects watched, it is perfectly safe, but the results are not constant.

Other new antipyretics, as antifebrin, salol, and exalgine, may be tried, but of the latter enough is not known to warrant a definite or strong opinion.

Quinine is a favorite drug with many eminent authorities, but the writer has seen it do harm when given in doses sufficient to produce a marked impression upon the temperature. It is sometimes given to the extent of 20 or 30 grains at once. This amount may dry up the expectoration and embarrass the patient's breathing by greatly increasing the cough trouble, and, moreover, it may fail altogether in reducing the temperature.

Salicylate of sodium, though open to many objections, if pure, answers even better than quinine (salicin is safer than the soda salt), but both are, perhaps, inferior to antipyrine.

The ice-bag applied to the chest, as already mentioned, is sometimes effectual, and it relieves pain at the same time, but it may aggravate pain in some cases.

Fenwick has introduced an excellent plan for the abstraction of body heat by a constant current of cool air. He has demonstrated its great value in pneumonia. It consists of a large and wide iron surgical cradle, from the central bar of which are suspended several small zinc pails half filled with ice. The patient, covered with a light sheet of opaque gauze, lies undressed upon the bed, and the cradle, covered by a light counterpane, is placed over him; a hot water bottle is placed at his feet. This plan may be kept in operation for many days, and when hyperpyrexia threatens, cold sponging may be tried in addition.

Cold baths are greatly used on the Continent in the treatment of pneumonia, and some authorities use them as a routine method even when the temperature does not exceed 102° or 103° F., and claim a low mortality. A bath of the temperature of about 60° is employed, and the patient is immersed for fifteen to twenty-five minutes, the pulse and temperature being closely watched. In mild cases, one must conclude that they are often unnecessary, and the difficulty of lifting a weak patient into and out of a bath is not one to be lightly undertaken in a disease in which the main principle of treatment should be to husband or save up any scrap of strength which the patient possesses. In such cases it has always appeared to the writer more rational to resort to cold sponging or wet compresses. It does not do away with this objection to quote a low mortality where the cold bath is used in a routine way, for the mortality might be still further reduced if the use of the bath was confined to selected cases. In hyperpyrexia with a fever heat of 105° or more, the cold bath is the best agent which we possess, and undoubtedly it affords the patient the best chance for life. Under such conditions all other antipyretics should be abandoned as waste of time in dealing with pneumonia.

The patient may be kept in the bath until the temperature falls to about 100°, and the heat of the bath may be reduced to 40° in severe cases. As the fall continues after his removal to bed, it is seldom wise to wait until the fever heat falls entirely to the normal during the immersion. Where there is much prostration the heat of the bath may be gradually reduced from about 80° F. at the beginning of the immersion to 50° F. at the end by adding cold water or ice. A full dose of stimulant may be given before the patient leaves his bed, and this may be repeated while in the bath or after he has been laid in bed again. The effect upon the pulse, temperature, and general condition is to be the guide when the question of repeating this treatment crops up again in four, six, or eight hours after the bath.

As failure of the heart's action is one of the most frequent causes of death in pneumonia, the pulse should be watched from the very onset of the attack, and as soon as the least sign of cardiac failure is noticeable the free exhibition of alcoholic stimulants is indicated.

It is not advisable, however, to order alcohol in a routine fashion in all cases of pneumonia from the beginning. In the early stages it may do harm. When the pulse shows signs of *weakness* and *frequency* the stimulant should not be withheld. Such is the present doctrine, and, although generally received and acted upon, there are not wanting signs which point to a serious modification of professional opinion in this direction. Nevertheless, with a pulse of 120, and compressible, one is not justified in withholding a large amount of alcoholic stimulants, considering our present knowledge of the disease; 8 to 12 ounces, or even 20 ounces, of good whiskey (of at least five years old) may be given in very severe or desperate cases. It is better to give

the whiskey in milk—a tablespoonful may be given in a large wineglassful of milk every hour or every two hours.

The writer believes that one serious mistake is often made in such cases—the patient being able only to take a small amount of nourishment, the physician or nurse insisting upon the alcohol, it may then become almost the only thing the patient takes.

Food is of vital importance from the beginning, and if more attention was bestowed upon it there would often be less necessity for thinking of alcohol. Beginning with milk, beef tea and strong soups or beef essences should be liberally administered, and the effect of large quantities of a carefully-prepared beef tea upon the failing cardiac muscle is not to be lost sight of. Though such a dietary can hardly be expected to build up tissue in a state like that in which the pneumonic patient is in, it certainly will tend to prevent tissue waste, and may save the patient's life by saving his cardiac muscle. The danger of over-stimulating the heart must not be lost sight of. Brandy may be given instead of whiskey; but, as a rule, wine in any form is inferior to these.

Digitalis has been strongly recommended in the treatment of pneumonia, both as a cardiac tonic and antipyretic. Petresco states that he has used this drug in large doses for the past six or seven years in every case of pneumonia "with eminently satisfactory results, the attack usually aborting by the second or third day, sometimes the patient being able to return to work after twenty-four hours."

The writer gave the drug a fair trial some years ago, and resolved never to depend upon it again, as it invariably proved a failure when used by itself. In no instance has he observed any marked antipyretic effects from it in pneumonia. Where cardiac power is failing, in spite of the free exhibition of alcohol, and where the breathing and cough are troublesome, the following combination may be tried:

℞.—Spt. ammon. aromat. ℥jss.
Spt. æther. ℥j.
Tinct. digitalis ʒij.
Moschi gr. lx.
Vin. ipecacuanhæ ʒvj.
Tinct. cinchonæ ad ℥vj.—M.

S.—One tablespoonful to be taken every four hours in a wineglassful of water.

This is a powerful diffusible stimulant, and, though the amount of digitalis in it is very much less than is recommended by those who use the drug as a specific for pneumonia, still it will be well to watch its effects upon the urine, and to omit this ingredient of the recipe if there should be anything like suppression after the above has been administered for three or four days. Petresco gives as much as 60 to 160 grains of the leaf daily in infusion.

Caffeine or the very soluble double salt—the sodio-salicylate—is

safer than digitalis, and acts more rapidly in cases of cardiac failure. One grain may be given every three hours in conjunction with stimulants. Spartein may be pushed with safety.

Under conditions like those just mentioned, blood-letting is still advised by some, but the benefits to be expected from it get less and less as the disease advances, and at this stage it would appear to be unjustifiable, unless in the presence of great dyspnœa and lividity, with a full pulse.

For cardiac failure in pneumonia there is, perhaps, no drug to be compared with strychnine in full doses, and the writer does not hesitate to recommend it in full hypodermic doses under these circumstances.

Sleeplessness will require careful management, and before the introduction of the valuable hypnotics of recent years, there was nothing before the physician but the ice-cap and opium or morphine. As already stated, there is much risk in giving narcotics on account of the nature of the expectoration. Choral is decidedly objectionable. In the opinion of the writer, its use in pneumonia is unwarrantable, owing to the danger of its cardiac depressant action.

Sulphonal, given in a little whiskey punch, is the best of all hypnotics in a condition like that of a serious pneumonic attack. Thirty grains may be given.

Paraldehyde is also safe and efficacious. The cold bath often relieves the delirium, insomnia, and dyspnœa when these symptoms are dependent upon or associated with a high temperature, if asthenia is not well marked.

The above measures may be expected to save life in those severe and desperate cases which probably would succumb to a purely "expectant" treatment, though there is no doubt mild cases, and sometimes every case in a mild epidemic, may be successfully treated by the expectant method.

Other plans of treating pneumonia are being extensively tried, and most encouraging reports are published of the results, but as the writer has no personal experience of their use, he need only briefly refer to them.

Clemens has been treating pneumonia by inhalations of chloroform during the last forty years, with only two deaths at the beginning of this period. He mixes the chloroform with alcohol, and saturates a piece of firmly twisted lint with the mixture. This is wrapped up in dry cotton, and held near to the patient's mouth and nose, so as to permit of the vapor being freely mixed with air. Narcosis is not to be produced. He claims for this treatment that it defibrinates the blood and modifies the local process of inflammation, so as to generally prevent hepatization, and that it hastens the termination and leads to the rapid disappearance of the physical signs of the disease.

Inhalations of oxygen have been highly recommended, and peroxide of hydrogen internally has been used extensively by Green in 30 minim doses, largely diluted every hour.

Numerous observers report glowingly of calomel, and Strong reports twenty cases treated successfully by doses of 20 grains every three hours, with no ptyalism and little catharsis.

Iodide of potassium has been successfully given in doses of 15 grains every three hours during the day and night by Nilsson.

Aconite, veratrum viride, arnica, gelsemium, muscarin, pilocarpine, acetate of lead, and many other drugs have been vaunted, but as the majority of these in even moderate doses depress the action of the heart, they need only be named to be condemned.

Sturges and Copeland, whose authority in this question is entitled to the greatest respect, state that there are no drugs possessing a specific action in pneumonia, and that the treatment of symptoms as the hyperpyrexia, pain, insomnia, etc., are the points calling for attention. They regard active delirium and asthenia as indications for free stimulation, and dyspnœa for bleeding from the arm. Believing that the more active treatments have given a higher mortality, they state that they are content with the adoption of means which have the advantage of obvious reasonableness, resting not on the shifting sand of to-day's therapeutics, but on broad principles of conduct universally recognized and understood. With this the writer fully agrees, and thinks their remarks a fair commentary upon the list of active drugs just mentioned.

During the later stages of pneumonia, after the temperature falls, and the immediate danger seems to have passed, the greatest care should be exercised, as the heart may still require assistance. Stimulants should be continued for a little time in full and then in gradually diminishing amounts, but all antipyretic or depressing remedies must be carefully avoided and the horizontal position maintained during convalescence. The most liberal diet is to be kept up, and the following tonic, or anything possessing similar action, may be safely administered. Fellow's and Easton's syrups are valuable.

℞.—Strychninæ gr. ¾.
Acid. nitrohydroclor. dil. ʒv.
Quininæ sulphatis ʒss.
Infusi calumbæ ad ℥viij.—M.

S.—A tablespoonful in a little water before meals three times a day.

PNEUMOTHORAX.

The treatment of air and pus in the pleural cavity has been mentioned under Empyema, upon page 235. In those cases where air has suddenly found its way into the cavity by perforation or rupture of the visceral pleura without external injury, recovery often follows if

the patient is kept quiet. Where pain is distressing, small inhalations of chloroform, cupping, venesection, or hypodermic injections of morphine, may be tried.

Where there is evidence of the air within the thorax being at a higher pressure than the outside atmosphere, as proved by the great distension of the side and *marked* displacement of organs, tapping by a fine trochar and canula is necessary. It is generally held that this should not be done until a sufficient time has expired in order to allow of the closure of the aperture in the visceral pleura through which the air originally passed outward. Albersheim has, however, shown that frequent aspirations do not prevent closure of the aperture, and they effectually prevent the formation of such adhesions as are fatal to the future through expansion of the lungs. Hence he advises aspiration.

The best rule for guidance should be that no operative interference is to be undertaken, except in the presence of very marked pain and distress, and then it will generally be found sufficient to tap with a fine trochar, so as to permit the free escape of the imprisoned air, until equilibrium is established. A drainage-tube may be left in where there is much fluid or fetor, but as a rule, when this is the case, the larger opening desirable in doing the ordinary empyema operation should be made. Bouverst recommends the internal use of opium to stop all coughing, and he insists that the canula should be left *in situ*.

POISONED WOUNDS—See under Wounds and Septicæmia.

POISONING.

In the treatment of poisoning, the first consideration in the great majority of cases will be to evacuate the contents of the stomach when this is possible. This may be accomplished by emetics or by the stomach-pump, or by tickling the fauces when these agents are not at hand. In poisoning by the strong mineral acids and all corrosive substances the stomach-pump is contra-indicated, but in the case of corrosive substances like carbolic acid this may be used cautiously if a soft tube be employed. Indeed, the soft India-rubber tube of the stomach-pump can scarcely do any harm except in the most destructive instances of poisoning by concentrated sulphuric or nitric acid, and the pump should always be fitted with such a tube in at least two sizes. When at hand, the pump should be preferred to every other means of emptying the stomach, and except in the limited number of cases just mentioned, it may be used even when there is room for considerable doubt in the diagnosis of poisoning in patients found in insensible or comatose conditions. The coroner's court will justly censure the practitioner who has been in attendance upon a patient picked up in an insensible condition if the evidence afterward produced proves that a narcotic poison had been swallowed, though when seen by the physician no such evidence had been forthcoming and the symptoms pointed to head injury, uræmia, or apoplexy. The cautious use of the pump with the rubber-tube,

when scientifically carried out, can in no way injure the patient's chances of recovery should the case ultimately turn out not to be one of poisoning; and as every minute's delay may be serious for the patient, and as there is thus short time for counsel and debate, he should be prepared to act accordingly and make his error upon the safe side.

The first time of using the stomach-pump is sure to be a bungling affair if the operator feels timorous or nervous. The tongue being depressed by the left index-finger as the patient is seated in a chair, with the head well steadied by an assistant, and the gag in position, the tube is to be pushed steadily, boldly, and rapidly through the mouth, pharynx, and œsophagus until the stomach is reached. Though it is more difficult to pass the soft rubber tube, the confidence in its perfect harmlessness will be of great importance to the novice. He should not be deterred by the sound which may be produced by air passing through the tube as its extremity glides past the epiglottis, this ceases as the rubber is passed home into the stomach. During the pumping, by reversing the action of the levers, a little water may from time to time be sent into the stomach to clear the tube of any solid obstruction, and before withdrawing it finally, tepid water should be injected into the organ, and this should be pumped out again, the operation being continued until the washings return clear. The antidote may be mixed with the water, and in many instances a quantity of this should be left in the stomach. In pumping opium or alcohol cases, after the washings return clear and free from odor, the stomach may be partially filled with strong infusion of tea or coffee.

The syphon tube may take the place of the stomach-pump in most cases.

Thirty grains of sulphate of zinc or 10 grains of sulphate of copper in a tumblerful of tepid water will prove efficient emetics; and apomorphine, $\frac{1}{10}$ grain injected hypodermically, acts with great certainty and rapidity when the patient is unable to swallow. Notice should be taken of the fact that though patients may often take apomorphine in doses of $\frac{1}{4}$ to $\frac{1}{2}$ grain by the mouth without experiencing nausea, this dose might prove fatal if given by the hypodermic method, owing to its rapid depressant effect upon the heart.

Mustard in dessertspoonful doses, in copious quantities of tepid water, may be used when the above emetics are not at hand. Ipecacuanha and antimony are too slow in their action to be depended upon.

The contents of the stomach when ejected (or when obtained afterward upon opening the body) should be carefully preserved for further investigation. This is often overlooked in the exciting period of treatment.

The writer has several times successfully pumped and washed out the stomachs of infants and very young children with a soft India-rubber male catheter, attached to the nozzle of an ordinary large glass or metal syringe.

The following formula (from the *Pharm. Rundschau*) may be employed as a *general antidote for any poison of unknown nature:*

℞.—Calcined magnesia
Powdered wood charcoal } . . Equal quantities.—M.
Hydrous peroxide of iron

Half an ounce of each of these may be given in a tumblerful of water every half hour until three doses be taken.

The following brief alphabetical list of poisons, and their antidotes and treatment is taken from the 5th edition of the author's work on *Pharmacy, Materia Medica, and Therapeutics,*" page 623, and may prove useful for reference in emergency:

Acids, Mineral.

The stomach-pump should *not* be used. Alkalies—lime, soap, chalk, potash, soda, or magnesia—moderately diluted with water, may be freely given. In the absense of these, plaster off a wall, oils (almond or olive), and small doses of morphine hypodermically should be administered; all food should be given by the rectum. At a later stage, when the danger of perforation has passed off, bland mucilaginous foods, like barley water, linseed tea, and white of eggs may be freely given.

Acid, Prussic (or Hydrocyanic).

The stomach, if possible, should be emptied by the stomach-pump or by a rapid emetic (½ drachm of sulphate of zinc); hypodermic injections of atropine ($\frac{1}{60}$ grain); 2 minims of the 1 : 100 solution of atropine may be given, and repeated in thirty minutes if necessary. Ammonia, or whiskey, inhalation of oxygen, ammonia, or chlorine, cold and hot affusions alternately, and *artificial respiration*, are the best agents to resort to.

Freshly precipitated oxide of iron, followed by a solution of carbonate of potassium, is to some extent a chemical antidote, but *free stimulation* after the evacuation of the stomach must be alone relied upon.

Aconite (and Hellebore or Veratrine).

The stomach-pump or emetics should be used; $\frac{1}{10}$ grain of apomorphine hypodermically, or a tablespoonful of mustard in warm water, or ½ to 1 drachm of sulphate of zinc should be given as soon as possible. Stimulants—whiskey and ammonia hypodermically, with 20 to 30 minims of *tincture of digitalis* or 2 minims of liquor atropinæ (1 : 100) should be then administered. Strychnine may be given ($\frac{1}{30}$ grain) by mouth, rectum, or hypodermically.

The patient should be kept horizontally on his back, and in a state

of absolute rest, and sinapisms applied to the heart and extremities; and dry heat, friction, and artificial respiration kept up unceasingly. Murrel recommends inhalations of nitrite of amyl.

Alcohol.

The stomach-pump should be promptly used, and the stomach filled through it with strong coffee, to which a little ammonia should be added; or a hypodermic injection of $\frac{1}{10}$ grain of apomorphine may be given in the absence of the pump; sinapisms, cold affusion, nitrite of amyl inhalation, or electricity may be tried, and in *desperate* cases, boiling water may be used to cause immediate vesication of the skin over the soles of the feet. The hypodermic injection of $\frac{1}{100}$ to $\frac{1}{50}$ grain of strychnine is of unquestionable value, as pointed out by Gibson.

Ammonia and Alkalies.

The stomach-pump should *not* be used. Weak acids (acetic preferable) may be given, largely diluted, and followed by draughts of almond or olive oil or of melted butter, and demulcent drinks.

Tracheotomy may be required for the œdema of the glottis, and morphine hypodermically for the shock.

Antimony (Tartar Emetic).

Stomach-pump or emetics are not generally required, as vomiting sets in soon. Tannin, strong tea, or gallic acid, or any diluted astringent tincture or infusion containing tannin, may be freely given, followed up by the hypodermic or rectal administration of alcohol, to which small doses of digitalis or strychnine may be added. White of egg, barley water, or linseed tea may be given freely.

Butter of Antimony. The treatment of poisoning by this preparation of antimony should be the same as for the mineral acids—viz., magnesia, soap suds, chalk, potash, or soda, followed by oil and milk.

Arsenic.

The stomach-pump or emetics, or $\frac{1}{10}$ grain of apomorphine should be injected even when vomiting has already taken place. Freshly prepared moist peroxide of iron (prepared by adding soda or ammonia to the tincture of iron, and filtering rapidly through muslin or cambric) or dialyzed iron in ounce doses, diluted, or, in the absence of these, magnesia freely, or animal charcoal, olive oil, or lime-water, must be freely given; demulcent drinks and stimulants by mouth or rectum are also indicated. Large doses of castor oil are essential to clear out the intestinal tract and to prevent further absorption.

Atropine and Belladonna.

The stomach-pump or emetics, and afterward the following are to be given: Tannin, charcoal, or tea, morphine ($\frac{1}{2}$ grain) by subcutaneous injection, or laudanum by the mouth, or pilocarpine ($\frac{1}{3}$ grain) subcutaneously, followed by purgatives.

The poison being excreted by the kidneys, the bladder should be emptied by the catheter to prevent reabsorption. Eserine in small doses has been advocated as an antagonist, but pilocarpine is better. Free stimulation, counter-irritation, and artificial respiration may be necessary.

Cannabis Indica.

The stomach-pump or emetics, especially apomorphine hypodermically ($\frac{1}{10}$ to $\frac{1}{8}$ grain), are to be given, and the symptoms treated as they present themselves. It will generally be found necessary to both purge and stimulate.

Camphor.

Stomach-pump or emetics, and copious draughts of water, with brisk saline cathartics, and general counter-irritation, or cold and hot douches alternately, afford the best means of dealing with this poison.

Cantharides.

Stomach-pump or emetics, mucilaginous drinks, or, in their absence, oils, chalk, a little opium by the mouth, and a morphine suppository by the rectum, should be used.

Carbolic Acid.

The stomach-pump with its soft rubber tube should be used, after which the organ should be thoroughly washed out with pure glycerin or with solution of Epsom or Glauber's salt. Give oils, egg albumin, and warm mucilaginous drinks, with any soluble sulphate, and finally, freely stimulate, counter-irritate, and inject $\frac{1}{60}$ grain of atropine. Though there is no known antidote, the writer—in a case where half a cupful of the strong acid was taken in a fit of drunkenness—after the contents of the stomach were evacuated, washed that organ out repeatedly with pure glycerin, using half a gallon of it, the glycerin dissolving the excess of acid out of the swollen mucous membrane, and the patient made a good recovery. He has since satisfied himself that this is the best treatment whenever the strong acid has been swallowed.

Chloral Hydrate.

The stomach-pump or emetics, especially injection of apomorphine $\frac{1}{10}$ grain should be used, and these must be followed by injections of

strychnine ($\frac{1}{20}$ grain) or of atropine ($\frac{1}{25}$ grain), caffeine (5 grains) or free stimulation with ammonia, whiskey, or ether, and sinapisms. *Particularly external warmth.* Electricity and artificial respiration; inhalation of amyl nitrite may be tried. The patient should be roused and prevented from sleeping, and, as death may occur from the diminution of the body heat, warmth is essential. A pint of strong, warm coffee into the rectum, as advised by Murrell, may save life.

Chlorine.

Chlorine, when inhaled, must be treated by inhalations of ammonia of sulphuretted hydrogen. If the poison has been swallowed it should be neutralized by large quantities of albumin and mucilaginous drinks.

Chloroform.

When symptoms of an alarming interference with the breathing or circulation come on during anæsthesia, the tongue should be drawn forward, artificial respiration, cold affusion, free ventilation by a current of air, turning over the patient upon his left side, or inversion of the body, may be tried.

Hypodermically—whiskey, ammonia, strychnine, or digitalis, or inhalation of nitrite of amyl, may be given. Galvanism is doubtful. If the chloroform has been swallowed, use the stomach-pump, or give $\frac{1}{10}$ grain of apomorphine, and proceed as if inhaled.

The following practical rules are appended to the recent report of the Hyderabad Commision, and the reporters state "that the Commission has no doubt whatever that, if the rules be followed, chloroform may be given in any case requiring an operation with perfect ease and absolute safety, so as to do good without the risk of evil":

1. The recumbent position on the back and absolute freedom of respiration are essential.

2. If during an operation the recumbent position on the back, cannot, from any cause, be maintained during chloroform administration, the utmost attention to the respiration is necessary to prevent asphyxia or an overdose. If there is any doubt whatever about the state of respiration, the patient should be at once restored to the recumbent position on the back.

3. To insure absolute freedom of respiration, tight clothing of every kind, either on the neck, chest, or abdomen, is to be strictly avoided; and no assistants or bystanders should be allowed to exert any pressure on any part of the patient's thorax or abdomen, even though the patient be struggling violently. If struggling does occur, it is always possible to hold the patient down by pressure on the shoulders, pelvis, or legs, without doing anything which can by any possibility interfere with the free movements of respiration.

4. An apparatus is not essential, and ought not to be used, as, being made to fit the face, it must tend to produce a certain amount of

asphyxia. Moreover, it is apt to take up part of the attention which is required elsewhere. In short, no matter how it is made, it introduces an element of danger into the administration. A convenient form of inhaler is an open cone or cap, with a little absorbent cotton inside at the apex.

5. At the commencement of the inhalation care should be taken, by not holding the cap too close over the mouth and nose, to avoid exciting struggling or holding the breath. If struggling or holding the breath do occur, great care is necessary to avoid an overdose during the deep inspirations which follow. When quiet breathing is insured, as the patient begins to go over, there is no reason why the inhaler should not be applied close to the face, and all that is then necessary is to watch the cornea, and see that respiration is not interfered with.

6. In children, crying insures free admission of chloroform into the lung; but, as struggling and holding the breath can scarcely be avoided, and one or two whiffs of chloroform may be sufficient to produce complete insensibility, they should always be allowed to inhale a little fresh air during the first deep inspirations which follow. In any struggling persons, but especially in children, it is essential to remove the inhaler after the first or second deep inspiration, as enough chloroform may have been inhaled to produce deep anæsthesia, and this may only appear, or may deepen, after the chloroform is stopped. Struggling is best avoided in adults by making them blow out hard after each inspiration during the inhalation.

7. The patient is, as a rule, anæsthetized and ready for operation to be commenced when unconscious winking is no longer produced by touching the surface of the eye with the tip of the finger. The anæsthetic should never, under any circumstances, be pushed until the respiration stops; but when once the cornea is insentive, the patient should be kept gently under by occasional inhalations, and not be allowed to come out and renew the stage of struggling and resistance.

8. As a rule, no operation should be commenced until the patient is fully under the influence of the anæsthetic, so as to avoid all chance of death from surgical shock or fright.

9. The administrator should be guided as to the effect entirely by the respiration. His only object, while producing anæsthesia, is to see that the respiration is not interfered with.

10. If possible, the patient's chest and abdomen should be exposed during chloroform inhalation, so that the respiratory movements can be seen by the administrator. If anything interferes with the respiration in any way, however slightly, even if this occurs at the very commencement of the administration, if breath is held, or if there is stertor, the inhalatisn should be stopped until the breathing is natural again. This may sometimes create delay and inconvenience with inexperienced administrators, but experience will make any adminis-

trator so familiar with the respiratory functions under chloroform that he will in a short time know almost by intuition whether anything is going wrong, and be able to put it right without delay before any danger arises.

11. If the breathing becomes embarrassed, the lower jaw should be pulled, or pushed, from behind the angles forward, so that the lower teeth protrude in front of the upper. This raises the epiglottis and frees the larynx. At the same time, it is well to assist the respiration artificially until the embarrassment passes off.

12. If by any accident the respiration stops, artificial respiration should be commenced at once, while an assistant lowers the head and draws forward the tongue with catch-forceps, by Howard's method, assisted by compression and relaxation of the thoracic walls. Artificial respiration should be continued until there is no doubt whatever that natural respiration is completely reëstablished.

13. A small dose of morphine may be injected subcutaneously before chloroform inhalation, as it helps to keep the patient in a state of anæsthesia in prolonged operations. There is nothing to show that atropine does any good in connection with the administration of chloroform, and it may do a very great deal of harm.

14. Alcohol may be given with advantage before operations under chloroform, provided it does not cause excitement, and merely has the effect of giving the patient confidence and steadying the circulation.

Colchicum.

Stomach-pump or emetics, mucilaginous drinks, albumin, or strong tea or tannin should be given, and these should be followed by a purgative, after which free stimulation may be required, and symptoms met as they arise.

Conium.

The stomach-pump or emetics, tannin, and castor oil should be used. Stimulate freely by ammonia. Hypodermics of strychnine or atropine may be tried, and artificial respiration persevered with.

Copper Salts.

The stomach-pump or emetics must be resorted to if free vomiting has not occurred; yellow prussiate of potassium, egg albumin or milk, which form insoluble copper salts, are to be given; mucilaginous drinks, and wheaten flour or water in which yolks of eggs are suspended, and the free use of opium to allay irritation, are called for.

Corrosive Sublimate.—See Mercury.

Creasote.

The same treatment may be employed as in poisoning by carbolic acid.

Croton Oil.

The general treatment for irritant poisons may be used, viz.: Emetics, or, if in the early stage, the gentle use of the stomach-pump, demulcent drinks, soothing enemata, and opium. Free stimulation and counter-irritation may be necessary.

Cyanide of Potassium.

Poisoning is to be treated as if hydrocyanic acid had been swallowed, and if seen at once give solution of ferri sulph., and alternate hot and cold douche, while atropine is given by hypodermic injection.

Digitalis

The stomach-pump or emetics, especially sulphate of zinc, ½ drachm, or $\frac{1}{10}$ or $\frac{1}{8}$ grain of apomorphine hypodermically, tannin, or animal charcoal, free stimulation, and the hypodermic injection of $\frac{1}{120}$ grain of aconitine, and the free use of opium, are required. Muscarin ($\frac{1}{3}$ grain) is antagonistic, and alcohol should be given.

The patient should be kept absolutely quiet, and in the horizontal position.

Elaterium.

Emetics or the stomach-pump must be used. Demulcent drinks and opium are to be administered freely, and the general treatment of the symptoms of gastro-intestinal irritation is to be followed.

Eserine, or Calabar Bean.

Emetics or the pump, with tannin or any tannin-containing liquid, may be employed, but hypodermic injections of atropine ($\frac{1}{30}$ grain), until the pupils widely dilate, afford the best chance. Strychnine and chloral have been recommended.

Artificial respiration should be assiduously tried, with friction and warmth externally.

Ether (Inhalation).

Pull forward the tongue, give free current of air, commence artificial respiration, and treat as if chloroform poisoning.

Fungi, or Muscarin.

Emetics or the pump should be used, and atropine given hypodermically ($\frac{1}{60}$ grain), and repeated until the pupils dilate, or digitalis

or morphine, may be given. Free stimulation, sinapisms, and friction may be required.

The writer has had to treat a large school of children who had eaten fungi. Many were very bad, and about six of them appeared to be dying when first seen. Atropine appeared to act like magic, and all made a good recovery.

Gelsemium.

The stomach-pump and emetics are to be used, and bicarbonate of potassium and tannin freely given; warmth, free stimulation with alcohol, electricity, and artificial respiration are to be kept up.

Hypodermics of ammonia or atropine, or digitalis, are partially antagonistic. The best result will follow 3 minims of atropine solution (1 : 100).

Hydrocyanic (or Prussic) Acid.

Antidote and treatment are described under Acid, Prussic.

Hyoscyamus.—Same as for Atropine.

Iodine.

Emetics or the *cautious* use of the rubber tube of the stomach-pump should be employed, together with the free administration of starch, arrowroot, bread, boiled potatoes, flour, lime-water, and demulcent drinks.

Laburnum.

The stomach-pump, if possible, should be always used, even if vomiting has occurred, as portions of seeds, etc., may remain in the stomach. Free stimulation, and, in bad cases, hypodermic injection of ammonia. Counter-irritation, friction, and the cold douche are necessary.

Lead Salts.

The stomach-pump, or, preferably, a large emetic of sulphate of zinc, which is also an antidote, should be given, and followed by milk, white of egg, diluted sulphuric acid, Epsom or Glauber's salts, or phosphate of sodium, sulphuretted hydrogen, or Harrogate water. Demulcent drinks, with mild opiates to allay pain and spasm, may be administered. (See also under Plumbism.)

Lime.

Carbonic acid—any aërated water, as soda water or lemonade—is very useful; or weak acetic acid or vinegar, freely diluted, and followed by oil or demulcent drinks, may be swallowed.

Lobelia (or Tobacco).

Emetics or the pump should be employed, as should also tannin, and free stimulation externally by sinapisms, friction, and dry heat, internally or hypodermically by alcohol, ammonia, and ether, with strychnine ($\frac{1}{30}$ grain), and small doses of opium. The patient must be kept strictly in the horizontal position.

Mercury (Corrosive Sublimate).

Emetics, or the very cautious use of the pump will be required. (The pump should not be used except in the very early stages of the poisoning.) Albumin, or gluten (prepared by washing flour in a muslin bag), demulcent drinks, milk, and oil are to be given by the mouth, and morphine and alcohol, subcutaneously.

Morphine.—See Opium.

Muscarin (or Mushrooms).

Same treatment as in poisoning by Fungi, viz., the subcutaneous administration of atropine after the use of an emetic or the pump.

Nux Vomica.—See Strychnine.

Opium (or Morphine).

The stomach-pump, or, in its absence, emetics (if capable of swallowing), must be resorted to, or $\frac{1}{10}$ to $\frac{1}{5}$ grain of apomorphine injected hypodermically. The stomach should be washed out with tepid water, and filled with strong coffee or tea, or any infusion or liquid containing tannin.

Caffeine, atropine, or strychnine hypodermically, is to be administered. This latter should be repeated frequently as long as there are dangerous cardiac or respiratory symptoms; $\frac{1}{75}$ grain may be given every two or three hours. Flagellations, cold and hot affusions alternately, electricity, extensive sinapisms, or very hot water, to cause vesication in desperate cases, must be employed to rouse the patient, and when once aroused he should never be allowed to fall asleep again, but should be kept continually on the move, though every care must be exercised lest this should be carried too far so as to induce exhaustion, as is, unfortunately, often done. Artificial respiration may be required.

Nitric Acid.—See under Acids, Mineral.

Oxalic Acid.

The pump or emetics must be used. Lime (lime-water, putty of lime, or chalk) is the best antidote; one good dose of castor oil, counter-irritation, free stimulation, and the treatment for gastro-enteric inflammation should be followed.

Pilocarpine.

The stomach-pump or emetics will be required, together with the free administration of tannin and the hypodermic use of its antagonist —atropine—in $\frac{1}{40}$ to $\frac{1}{20}$ grain doses.

Phosphorus.

The pump or emetics will be necessary. Sulphate of copper, 5 grains every fifteen minutes, is both antidote and emetic. French oil of turpentine or any old oil of turpentine, purgatives, and demulcent drinks containing magnesia and albumin should be swallowed. Oils and butter should be avoided.

Physostigma.—See under Eserine.

Potash (Caustic).

Emetics must be administered. The pump should *not* be used. Weak acids (vegetable preferred, and largely diluted), oils, and butter may be freely administered. The after-treatment will consist in rectal feeding, and after the danger of perforation has passed away, the free use of barley water, linseed tea, and other demulcents.

Potassium Chlorate.

The pump or emetics and profuse demulcent drinks and purgatives are indicated, along with hot blanket baths and the treatment for acute Bright's disease (page 72).

Silver Nitrate (or Lunar Caustic).

Large doses of common salt or sea water should be swallowed. Emetics and the pump (India-rubber tube) should be used, and white of egg injected into the stomach after the poison is removed. Yolk of egg, wheaten flour, or milk mixed with water should be freely administered.

Soda (Caustic).

Acids and oils will be require (as for potash).

Stramonium.

Emetics, tannin, free stimulation, and hypodermic use of morphine are the necessary treatment (same for atropine and belladonna).

Strychnine.

The pump or emetics, especially a hypodermic injection of $\frac{1}{10}$ to $\frac{1}{5}$ grain apomorphine, must be given, followed by charcoal or tannin

in large quantities. Tobacco by rectum (with great caution—not more than 20 grains at once), bromide of potassium in large doses (2 drachms to 2 ounces), chloral, chloroform, calabar bean, conium, morphine, ether, etc., are recommended. The writer believes that poisonous doses of *alcohol* afford the best treatment given both by mouth and rectum. Artificial respiration may be tried. Chloroform inhalation may be kept up as long as the convulsions are severe.

Sugar of Lead.

Sulphate of zinc, albumin, etc. (See lead.)

Sulphurets and Sulphuretted Hydrogen.

Inhalation of air containing a small percentage of chlorine in it, and the free administration of a very weak solution of chlorinated lime or soda, constitute the necessary treatment.

Sulphuric Acid.—See under Acids, Mineral.

Tartar Emetic.

Tannin, green tea, etc. (See Antimony.)

Tobacco.

Emetics, tannin, free stimulation, and hypodermic injection of strychnine ($\frac{1}{20}$ grain), are indicated, and the recumbent position must be strictly maintained (as for lobelia).

Veratrine.

The pumps or emetics must be used, followed by alcohol, opium, etc., as for aconite (which see).

Zinc Salts (chiefly the Chloride, as Burnett's Fluid.)

The rubber tube of the stomach-pump should be used with caution, or emetics, especially apomorphine, $\frac{1}{10}$ grain, may be injected hypodermically. Egg albumin, tea, tannin, milk, alkalies or their carbonates, demulcent drinks, and soothing enemata containing a little laudanum, are to be administered.

POLYPI.

The treatment of these growths projecting from the various mucous surfaces of the body belongs to the province of the surgeon. Their removal may be effected in various ways. When the tumor is pedunculated, and the pedicle can be grasped by a stout pair of forceps, and by torsion, avulsion, ligature, or section by means of the knife, scissors, écraseur, or cautery, the growth may be safely removed. In

the case of nasal polypi, if a cold wire-loop snare can be got around the pedicle or base of the growth by passing the snare along the floor of the nostril and adjusting the noose, there will be little difficulty in removing the polypus. More frequently, however, the part of the polypus which can be distinctly seen must be grasped by a fine pair of dressing forceps, and torn forcibly away from its attachments because the snare cannot be got around its base or pedicle by any artifice. In the firm, tough, or fibrous polypi springing from the roof of the nasal cavity, or from the bony prominences of the naso-pharynx, the best method of treatment is to use the wire of the galvano-cautery, and it may be often necessary to enlarge the opening of the nares to get thoroughly at the growth. Sometimes removal can be managed from the pharynx. The snare with pianoforte wire is always to be preferred to the evulsion with forceps when possible, and when followed by the sparing use of chromic acid it appears upon the whole to be the best method of removing polypi from the nasal cavities.

Baracz, by a comparatively simple operation, reaches polypi which cannot be removed by the forceps through the nose. After applying cocaine to the nose and lips he makes an incision through the lip immediately to one side of the middle line, and carries it up through the fleshy part of the nose on one side of the septum as far the nasal bones. If the growth be *very* large he cuts the nasal bone, and turns it aside with the flap of the skin, which, upon being forcibly retracted, permits of the nasal aperture being somewhat enlarged by bone forceps. Upon introducing one finger into the nostril and another behind the soft palate, the polypus can be easily enucleated by the finger-nail. He states that by this plan of operating, the entire nasal cavity, as far as the base of the skull, can be reached as effectually as in the more formidable operation of Langenbeck. There is little hemorrhage, and upon bringing the edges of the wound accurately together, only a linear scar remains.

The medical treatment of nasal polypi is generally unsatisfactory, but occasionally a soft gelatiniform polypus springing from the turbinated bone may be caused to shrivel up and disintegrate by the continual use of a snuff consisting of finely-powdered tannic acid. Parker has employed salicylic acid with advantage in the same way, and powdered sulphate of zinc or alum is sometimes successful. The spray of strong alcohol may be used, or various astringent solutions may be applied with a large camel's hair brush, or the same solutions may be injected by the hypodermic needle into the growth, or, in more dilute solution, they may be used as nasal douches. Glycerin of carbolic acid (1 : 5) and solution of chloride of iron may be thus used. Ethylate of sodium solution may be efficacious if brushed over soft or even moderately fibrous polypi. Chromic acid fused upon a roughened probe is the best of all agents for touching small polypi.

Though these methods of dealing with nasal polypi must be considered as anything but satisfactory in the first instance, especially

where the growths are within easy reach of the snare or polypus, nevertheless they are of great value as auxiliaries to the surgical measures.

Thus, where clusters of soft polypi hang from the interior of the nasal walls the surgeon must often desist before he can feel confident that he has been able to seize and tear off all of them. Some will only be partially removed, and, owing to the hemorrhage, frequent sittings become necessary. Then, again, the pedicles may sprout up or the growths show a tendency to return. In such circumstances the tannin or salicylic snuff is of great value.

When the surgeon can see the pedicle or base of the growth clearly it is the best practice to touch the stump or spot from which the polypus sprang with the galvano-cautery or chromic acid.

Cocaine in all these performances is of the greatest value. Post-nasal growths are easily removed by the ring-shaped curette of Hartman.

In the case of uterine polypi, the ligature, torsion, snare, écraseur, galvano-cautery wire, or excision by knife may be selected, according to the peculiar conditions maintaining in each case. Small polypi can generally be easily twisted off by grasping the pedicle in a pair of stout ovum forceps. When large, firm polypi grow from the ceiling of the uterus, rough or strong traction upon their pedicles, especially if these are short, may cause a portion of the uterus to become inverted and this might be included in the écraseur if the surgeon was not upon his guard. This once almost occurred with the writer in removing a very large sessile polypus with the chain écraseur.

Where the polypus is sessile, and there is much danger of hemorrhage, the wire of the galvano-cautery affords the safest and most efficient means of removing the growth.

In the case of large intra-uterine polypi, after cutting through the pedicle the detached growth may refuse to be dragged through the cervix, as occurred to the writer in the case referred to. In this event the tumor itself may be caught in the middle by the écraseur and divided, or the cervix may be dilated by Barnes's bags.

Both these measures may be necessary in the first instance in order to reach the pedicle, and, if so, the method of rapid dilatation of the cervix by means of metal dilators is to be preferred.

The strictest antiseptic precautions before and after the operation should be maintained, and the vagina and uterus should be first freely swabbed with a mop soaked in 1 part of tincture of iodine and 2 parts of glycerin, and afterward washed twice a day, or oftener, with solution of boric acid.

POLYURIA OR DIABETES INSIPIDUS.

This condition, depending upon very different causes in many instances, will be promptly relieved by measures at one time which are

worthless at another. The treatment will become much more satisfactory when the pathology of the affection has been worked out. At present it is mainly empiric, and one remedy after another may be tried until the one which acts upon the unknown cause of the affection happens to be lighted upon. The most recent reports speak strongly in favor of antipyrine, and this drug can be administered at the same time that the older agents are being tried. The treatment of the affection will be found detailed at length under Diabetes Insipidus upon pages 174 and 175.

POST-PARTUM HEMORRHAGE (See page 315).

POTT'S CURVATURE—See Caries of Spine (page 113).

PREGNANCY, Disorders of.

The most common departure, and the one most frequently calling for therapeutic interference, is morning sickness. As a rule, when this is but slight and does not tell upon the patient's condition, the less drugging the better. The bowels should be kept free, and this may be in most instances accomplished by attention to diet or by moderate doses of cascara, castor oil, or enemata of tepid water without soap. The diet should be such as is most speedily digested, and, though a dry dietary generally does best, some cases can only get on upon food which is liquid, as strong beef tea, champagne, iced coffee, koumiss, etc. The horizontal position in bed, maintained for several hours after the morning meal, often checks the vomiting.

Of drugs and methods of treatment there is practically no end, and, as the plan which appears in one case to act as a charm may in the next prove useless, the physician will find himself driven to try one remedy after another until he finds the most efficient or until, as often happens, the vomiting stops spontaneously in spite of his exertions, for it cannot be denied that his exertions sometimes perpetuate the misery. It is, therefore, advisable to have a routine remedy which is perfectly harmless, and the following simple combination will be found of value in a surprisingly large number of mild cases:

℞.—Acid. hydrochlor. dil. ℥iv.
Tinct. aurantii amar. ℥j.
Infus. gentianæ ad ℥viij.—M.

S.—One tablespoonful to be taken in a little water three times a day.

It may be given before or after meals, as the experience of the patient decides, and calumba may be substituted for the gentian.

Tincture of nux vomica, in 5 to 10 minim doses, appears to act much in the same way as the above, and quinine occassionally proves useful also. Hydrocyanic acid, in doses of 2 minims, may be given

alone or mixed with either of these formulæ, or it may be given with the following:

Bismuth is a harmless drug and sometimes proves efficient. It may be given with the previously mentioned substance, or in combination with the following.

Pepsin is sometimes efficacious, and where it fails in preventing vomiting, it may do good by hastening digestion so that the patient derives more benefit from the food before it is rejected.

Ingluvin—a powder prepard from the gizzard of the common fowl—acts like pepsin, but is more frequently efficacious than this drug. It may be given in 10 grain doses every four or six hours, commencing before the patient leaves her bed for the day.

A favorite combination consists of several of the foregoing remedies. It is often efficacious in relieving the vomiting of gastric ulcer and dyspepsia, but often fails completely in pregnancy:

℞.—Acid. hydrocyan. dil. ℥j.
Morphinæ hydrochlor. gr. jss.
Liq. bismuthi (Schacht) ℥jss.
Vini pepsinæ ad ℥iv.—M

S.—One teaspoonful to be taken after meals three or four times a day.

Morphine has met with some favor, especially when given as a suppository by the rectum or vagina, though the writer has found far better results from administering the minute pearls, each containing $\frac{1}{16}$ grain, by the mouth. Sometimes it proves effectual when given hypodermically.

Oxalate of cerium has long maintained the reputation of being a specific in the condition under consideration, but the writer has been so uniformly disappointed with it that he seldom now uses it unless when most other remedies fail, and he finds then that it generally fails also. Three or 4 or even 8 grains may be given as a powder.

Carbolic acid is sometimes useful, but creasote is much better, and may be given in the form of capsule.

Salol in 2 grain doses acts in the samy way.

Cocaine has recently been highly praised, but appears already to be losing some of its reputation. One-quarter of a grain in solution may be given every two or three hours, and sometimes it acts more rapidly and effectively. One to 2 grains are sometimes given.

Antipyrine and antifebrin have been recommended, but it is very doubtful if they exert any beneficial action.

Paraldehyde in minute doses has been tried successfully in a limited number of cases. Three to 5 minims may be given every hour in syrup.

Chloral hydrate is given, but it must be used with caution. Its best results have been obtained when given with the following:

Bromide of potassium is very valuable, but it must be given in large

doses, and these sometimes increase the irritability of the stomach and are rejected. Hence the best method of giving the drug a fair trial is to give it in the form of an enema, combined with chloral. Guéniot uses 30 grains of bromide of sodium and 30 grains of chloral in 9 ounces of milk and water as a rectal injection.

The following combination of some of the previously-mentioned drugs may fairly have a trial in a bad case:

℞.—Cocainæ hydrochlor. gr. vj.
Antipyrin. ʒjss.
Potassii bromidi ʒv.
Inf. gentianæ ad ℥viij.—M.

S.—One tablespoonful to be taken three times a day, before meals, in a little water.

Aconite, given to the extent of producing its physiological effects, has been found by Wood to be often advantageous, though few will care to push a remedy of such potency so far.

Liquor potassæ, alone or combined with morphine, has sometimes given good results. Not more than 10 or 15 minims should be given, and the dose should be freely diluted.

Calomel has been tried in small doses frequently repeated, so as to produce salivation, but the practice is not to be recommended.

Tincture of iodine, Fowler's solution, and ipecacuanha wine have each been extolled, in doses of 1 minim diluted with water. Their effects are even more uncertain than most of the previously mentioned drugs. Tannin in 3 grain doses has occasionally proved useful.

When, however, in spite of all drugs, the vomiting continues so as to seriously weaken the patient, emaciation with thirst, a hot skin, and red tongue show themselves, the situation becomes serious, and feeding by the bowel must be commenced and steadily adhered to. Ice or ether spray to the epigastrium or sinapisms, if not before tried, should be applied and the patient rigidly confined to the horizontal position in bed.

Should the weakness and emaciation proceed, the physician may ultimately have to induce premature labor, but before doing so various attempts may be made in order to counteract or correct any source of irritation which possibly may exist in the region of the uterus, ovaries, or vagina. Thus, flexions of the uterus have been proved to be a cause in some cases, and relief has been known to immediately follow the adjustment of a properly fitting pessary.

Erosions, ulcerations, lacerations, or other abnormal conditions of the os or cervix, may be the exciting cause, and these may be treated by caustics, leeching, or suitable operations or applications. Cocaine in strong solution or in ointment, applied directly to the os, has stopped the vomiting in some cases; and a cotton-wool tampon saturated in glycerin has, by relieving congestion, removed the sympa-

thetic vomiting. The routine plan of applying strong nitrate of silver is to be condemned, but it may have a fair trial in severe cases before resorting to more serious measures.

Electricity has undoubtedly proved efficacious in several cases, and if used with proper precautions is not at all likely to induce abortion. The positive pole is placed in contact with the os or cervix, while the negative is applied over the lower dorsal vertebræ, and a *continuous* current, registering from two and a half to five milliampères, may be used for seven to ten minutes. Günther, who recommends this treatment, points out the danger of producing abortion if the current be interrupted, and he urges the necessity for avoiding this.

Copeman's plan may be tried before inducing labor. He recommended, and his practice has been successfully carried out by others, that the os should be dilated with the lower portion of the cervical canal.

When all measures have failed to stop the vomiting, and when nutrient enemata have been unable to prevent marasmus, the last resource, after consultation with another physician, should be undertaken, and the uterus should be emptied by procuring abortion, or by inducing premature labor. It is, however, needless to say that this procedure will be rarely called for, even by those extensively engaged in obstetric work.

The various other disorders of pregnancy are to be treated upon general principles, and need not be referred to here. Abortion has been dealt with under its appropriate heading, and albuminuria may be treated upon the lines laid down under its own heading or under Bright's Disease. Eclampsia will be dealt with under Puerperal Convulsions.

PRESBYOPIA.

The treatment of this condition can only be carried out by the use of proper convex glasses, which will enable the patient to read with comfort at about ten or twelve inches. It is a mistake to order strong lenses at first, and as the patient gets older the convexity of his glasses may be increased until he reads with comfort at nine inches. It may be necessary to correct both eyes for the same distance, and many patients prefer to use stronger glasses when working by artificial light.

PROCTITIS.

Inflammation of the rectum is to be treated upon the same lines as are indicated in the treatment of other inflammation. The cause should be sought for, and treated or removed when present, and fissures, piles, fistulæ, ulcers, gonorrhœal pus, worms, or foreign bodies should be dealt with before permanent relief can be expected. More difficult are the cases (of which the writer has chanced to see several)

where the proctitis is caused by discharge of pus from old abscesses or sinuses in the pelvis or in connection with disease of the vertebræ or pelvic bones.

Warm poultices, hot fomentations, or hot sitz baths may be tried at first, after which, or while sitting in the bath, the rectum may be irrigated by a stream of warm water. If arrangement is made for the return of the water, the injection can be carried out for considerable periods without dilating the inflamed bowel or exciting spasm in the sphincter. Iced water injections may be thus applied, and at a later stage antiseptic solutions, as boric acid, and, at later stages still, astringent injections may be thrown into the bowel.

Under a previous heading the writer has pointed out the great value of conium (see page 47) as a rectal sedative, and the ointment of this drug, prepared as there stated, is of the greatest benefit.

In very painful cases the juice of conium may be evaporated for a short period at a low heat, to expel any spirit contained in it, and 2 drachms, or what would correspond to this amount of the fresh juice, may be injected with good result.

Under Anus, Fissure of, page 46, the list of local sedatives has been discussed, and need not here be repeated.

Where the pain and tenesmus are caused by the passage through the rectum of irritating discharges, the writer has used the following injection successfully, with the view of shielding the inflamed membrane from irritation:

℞.—Bismuthi subcarb. ℥vj.
Vitellum ovi
Olei olivæ ℥ijss.
Acidi carbolici gr. xxx.
Aquæ rosæ ad ℥viij.—M.

S.—Half an ounce to be injected by a glycerin-syringe into the rectum when required.

PROGRESSIVE MUSCULAR ATROPHY—See Paralysis (page 587).

PROLASUS ANI et RECTI.

The first thing to be done is to effect the return of the prolapsed anus or rectum. This is generally an easy matter, and by gentle pressure with the surgeon's fingers the mass is slowly pushed back until beyond the reach of the sphincter; or the fingers of the patient's own hand, crowded together at their tips so as to form a cone, may be steadily pressed against the prolapse until it disappears.

In the case of children there may be more difficulty, and some pressure may be needed to press out the blood from the prolapsed bowel, and to overcome the resistance and struggling of the patient, he may be placed across the lap of the nurse, and his head depressed

almost to the ground. A speedy method is to oil the right forefinger, and pass it into the bowel and press it upward as if making a rectal examination, and the prolapsed mass generally speedily retreats.

A small pad of dry lint being placed over the anus, the nates may be strapped together by broad strips of adhesive plaster or a binder may be applied to the pelvis.

Cripps effects reduction in bad cases by wrapping a piece of lint round the index-finger, and then inserting it into the protruded canal of the gut. As the finger is pushed *upward*, the lint being dry, sticks to the mucous surface and assists reduction. After this has been effected the finger, which had been previously well oiled is slipped out, leaving the lint temporarily within the bowel.

A warm injection of about 8 ounces of water before the bowels are moved, the passage of the motion while the patient is as far as possible upon his side, and the injection of a very small quantity of very cold water afterward, was Brodie's method of dealing with all mild cases.

The cause of the prolapse should be carefully investigated and remedied. This may depend upon such a number of abnormal conditions that the physician should explore the pelvic region with care. The most common cause in adults of prolapse of the anus of lower part of the rectum is hæmorrhoidal growths, and, as already stated, when these are present the patient should be educated and warned to be certain to return the prolapsed mass after each evacuation. When the condition of the part warrants an operation for the piles, the prolapse is effectually cured by their removal. As a palliative remedy cold sponging, bathing, or cold water injections are most valuable in this as in most cases of prolapse. Worms when found should be expelled by injections of a large teaspoonful of common salt, dissolved in half a tumblerful of water.

Stricture of the urethra or rectum, enlarged prostate, a calculus in the bladder, or a polypus in the rectum or bladder, may be the cause, and the surgical procedures necessary to remove these causes will generally cure the prolapse.

In the case of children many authorities are convinced that improved hygiene may do much. Where there is a marked emaciation, if this can be remedied the prolapse disappears, hence the necessity for good feeding and such agents as cod-liver oil. Cripps lays stress upon the importance of restoring the cushions of fat in the ischio-rectal fossæ, the absence of which doubtless facilitates the descent of the bowel. The importance of attending to the bowels so as to prevent straining from constipation can hardly be exaggerated. Sulphur is the best laxative for this purpose.

Small, irreducible prolapses, which have existed for a considerable time, may be removed in the same way as if they were a ring of pro-

truding, internal piles. The continuous current has been used with success to restore the tone of the muscular fibres of the gut.

Drugs have been used in chronic reducible cases in order to avoid the employment of surgical measures, and they sometimes are of great value. Thus, moderately strong solution of tannin, krameria or oak bark decoctions, injections of alum, chloride of lime, hydrastis, nitrate of silver and other astringents may be injected in small quantities. Ice may be likewise used, a piece as large as a plum being inserted occasionally beyond the sphincter.

Ergot has, however, given much better results than any other drug. It is, however, more suitable in cases where the rectum is involved, but may be used in chronic anal cases. One, two, or three grains of extract of ergot (ergotine) should be injected, as originally suggested and carried out by Vidal into the prolapsed bowel. Glycerin injections (2 drachms) have proved very efficacious in the prolapse following the diarrhœa of children as shown by Rice.

A pad of lint, or a small, inflated rubber pad, or a plug may be necessary in chronic cases where a considerable amount of rectum is prolapsed. These may be fastened by a T-bandage or by tapes attached to the shoulders.

Brushing over the prolapsed anal mass by strong nitric acid is a very severe and may become a serious measure, but often it is a highly efficacious method when the anus only is involved. It is perfectly safe if the acid be applied in limited amount, as in the operation of linear cauterization.

The actual, or thermo-cautery may be used with great advantage in anal and in slight rectal prolapses, the iron being lightly drawn along the prolapsed membrane in a linear fashion.

Cripps prefers this method to all others in most cases. He operates with the patient in the lithotomy position, making four lines with the actual cautery by drawing the iron along the bowel in its long axis, one in front, one behind, and one on either side. These lines begin as high up as possible, and terminate at the anal margin. They should be about ¼ inch in width, and deep enough to sear thoroughly, but not to destroy the mucous membrane. Where the lines cross large veins, these should be tied on either side of the line with a Liston's needle. The bowel should be returned quickly, a strong rubber tube of ⅝ inch calibre and 7 inches long is passed into the rectum, and the space between it and the mucous membrane is to be packed all round with cotton wool, dusted with iodoform, the mucous surface being first protected by strips of oiled lint. Flatus finds an easy exit through the tube, while an even pressure is kept up. The rationale of the treatment is to excite inflammation in the submucous tissue, so as to bind the mucous and muscular coats together in order to prevent the initial slipping, which is the chief cause of the affection.

Excision of portions of the prolapsed mucous membrane may be performed so as to lead to contraction after cicratrization.

Curling recommends that in adults the anal aperture should be contracted, and the fall of the rectum prevented by the application of the mineral acids or by caustic potassium applied to the mucous membrane at this juncture with the skin. This does not seem to the writer to be as likely to result in permanent relief as linear scarification or removal of strips of the mucous membrane.

In very severe cases where a considerable portion of the rectum is constantly prolapsed, the best procedure is to dissect up and remove a broad flap of mucous membrane from the surface of the prolapsed bowel, the margins of the mucous membrane are then to be brought together by sutures so as to very considerably reduce the dimensions of the bowel, a second or third flap may be dissected off at opposite aspects, and the same plan of bringing together the margins of the gap left after dissection of the flap is to be carried out. The operation may be followed by alarming hemorrhage, and most careful after-treatment as for operations for extensive hæmorrhoids is requisite.

In still more serious cases circular resection of the gut may be performed, and Milkulicz has successfully resected two and a half feet of the prolapsed colon. McLeod has introduced an ingenious but heroic operation by which he fastens the upper end of the rectum to the anterior abdominal wall by a double series of silk ligatures passing through the mucous and serous coats of the bowel. Treves treats bad cases with an excision operation, which he has described in the *Lancet* of March, 1890.

PROLAPSUS UTERI.

As a rule, there will be no difficulty in replacing the prolapsed organ as the patient lies upon her left side or in the genu-pectoral position, steady, gentle pressure sufficing to restore the uterus to its normal position in the pelvis. Sometimes, where complete procidentia exists, it may be found difficult to accomplish this without resorting to the use of considerable force, which is not justifiable under these circumstances. The patient should be put to bed for a few days, when the rest will be found to have materially diminished the weight and size of the organ, so that steady pressure directed in the axis of the outlet, and afterward in the axis of the body of the pelvis, effects reduction.

In mild cases prolonged rest and the frequent use of astringent injections, such as the cold saturated solution of alum or decoction of oak bark, will often prove efficacious. It is a mistake to think that nothing can be done without inserting supports. Many cases, even where the organ has been long prolapsed, may be permanently cured by absolute rest for several days and the daily use of astringent lotions afterward, together with such measures as will reduce the size and weight of the enlarged or congested organ. The bowels and bladder must be regularly relieved.

A large tampon of absorbent cotton wool, soaked in glycerin 7 parts, and borax 1 part, and inserted into the vagina, where it may be kept for forty-eight hours, has a rapid action in reducing hyperæmia.

Tonic remedies, such as iron, quinine, and strychnine, internally, and sea bathing, with periods of absolute rest upon a hard sofa for several hours during the day, are not without their beneficial influence.

Where the bladder or anterior wall of the vagina prolapses, the patient should be instructed to pass water when resting upon her knees and elbows, and the physician should see that the daily regular use of the vaginal douche every eight hours is conducted efficiently and thoroughly. Thus a long vagina pipe should be used, and a copious stream of cold, or almost cold, water should be injected for three or four minutes, until all traces of mucus or discharge are washed away, after which a quart or more of the cold saturated solution of alum is injected. The continuous current is often beneficial in restoring the tone of the relaxed structures.

The pressure of tight clothing around the waist or pelvis must be avoided, and where the abdomen is very pendulous, a neatly-fitting abdominal belt, constructed by a skilful corset or truss maker, may be worn with advantage.

Some patients who cannot wear pessaries manage to keep themselves comfortable by the daily introduction of plugs or tampons of cotton wool inserted into the vagina, and removed at bed-time.

Where the above measures fail to give support, and the uterus continues to fall downward, there should be an attempt made to keep the organ up by means of a pessary.

Of these the variety is endless, but the physician should aim at the selection of a support which will not destroy the remaining elasticity or contractility of the vagina, or unduly stretch the uterine ligaments. Hence the old solid, globular, boxwood pessaries should not be selected, and the same objection applies to the thick boxwood ring or gum elastic ring instruments, though the writer has succeeded in keeping the uterus in position with these latter after failure with every other instrument. The elastic ring is often satisfactory where the vagina is very capacious, and those slender instruments containing a spring embedded in the rubber are to be preferred to the weighty thick rings of pure rubber. In mild cases, or where there is a good perineum, a well-fitting Hodge is by far the most satisfactory form of support, and, though it often may be disappointing by slipping out, when a suitable shape and size is selected which remains *in situ* there is generally nothing more to be desired.

Greenhalgh's elastic spring with cross bars or Galabin's vulcanite instrument may be found to succeed where Hodge fails. The former is indicated when the bladder tends to prolapse.

Where the procidentia is complete, and the perineum useless as a support, the cup and stem pessary of Barnes will generally prove satis-

factory. The neck of the uterus sits or lies in the cup, and the stem is supported from below by a wastband and perineal straps. There are various modification of this instrument, one of which is intended to be retained in the vagina without supports, but it generally falls out. Cutter's ring pessary acts upon the same principle at the stem instrument, and it is retained in position by a rubber strap attached to a waist belt.

Zwank's pessary sometimes keeps the uterus in position when all the above fail, but the writer has found that it so very often breaks and gets out of order that it would be almost necessary for the patient to permanently retain, the services of an instrument maker. Its blades should be inserted, closed, and then screwed out when in the vagina. It should be taken out generally at night, and inserted before getting up in the morning. If left in position for long periods, serious ulceration may be set up.

Gynecological massage and gymnastic exercises, according to Brandt's method, are said to be of the greatest use in prolapse, but Macnaughton Jones has entered a strong protest against this method, with which the writer heartily concurs.

Where the above palliative measures fail, or where, for special reasons, a more permanent or radical cure is desired, various surgical measures have been recommended and practised with varying success, the special operation being selected which, on account of the anatomical condition of the parts, appears to give the best prospects of success.

The operation of building up a new perineum where this part has been ruptured or destroyed in previous labors, is a rational procedure, and though it may fail to cure the prolapse, it generally succeeds in leaving the parts in such a condition as will enable the physician to most successfully remedy the displacement by a well-adjusted Hodge's pessary, which was not possible before. If this end can be completely gained, the physician may rest satisfied, unless the patient insists upon a more radical procedure. Sometimes, however, a new perineum cannot be made, and the number of operations which have been suggested to cause narrowing of the vaginal canal, or to produce lateral, or ventrofixation is beyond narrating in the space at our disposal.

Asch, as in eight cases, recently extirpated the uterus and resected the vagina for complete relapse; Others have been content to remove a portion of elongated cervix.

The operations of Simms and of Emmet, whereby a narrowing of the vagina is accomplished by the removal of flaps of mucous membrane from its anterior surface, or *posterior colporrhaphy*, which aims at the same object by removing portions of the posterior vaginal walls, may be adopted.

Péan passes a double row of sutures along each side of the vagina through the recto-vaginal septum and the vesico-vaginal septum respectively.

Simon's operation is an excellent one in some cases. He pares the surfaces of the posterior aspects of the labia majora and the neighboring tissues at the vaginal outlet, and after bringing the surfaces together by deep and superficial sutures, the perineum is thus greatly lengthened, and the uterus imprisoned.

Various methods have been suggested from time to time for the occlusion or contraction of the vaginal canal by employing caustics, or the cautery; other means by mechanical pressure, so as to cause sloughing and subsequent cicatrization of the ulcerated or eroded surfaces have been tried, but these methods are now seldom resorted to.

Phillips points out the different ways in which ventral fixation of the uterus to the anterior abdominal wall by abdominal section and suturing of the organ or its appendages may be carried out, viz.: 1. By hysterectomy—removing the uterus and bringing the stump into the abdominal wound. 2. Removal of both ovaries and appendages, and suturing one or both stumps into the abdominal wound. 3. Suturing the round ligaments as they pass obliquely from the uterus, and bringing the stitches out external to the median incision. 4. Hysterorrhaphy—by passing stitches through the muscular tissue of the fundus. 5. Removal of the appendages on one side only and suturing the stump, not into the wound, but external to it, by making the stitches pierce the abdominal wall, adhesion between the stump and parietal peritoneum being the object to be attained.

PROSTATE, Inflammation of.

While soothing remedies are being employed for the relief of the prostatitis, the cause of the attack should receive attention. Thus, gonorrhœa, cystitis, or an impacted calculus must be met by appropriate remedies. Absolute rest in bed, except when the patent is sitting in a sitz-bath, is essential. The bowel should be cleaned out by a copious warm water enema, and by a little ingenuity a stream of warm, hot, or ice-cold water may be made to irrigate the lower part of the bowel, the temperature of the water depending upon the sensations of the patient. Hot poultices or warm fomenations, or a large piece of ice occasionally introduced into the rectum, act beneficially upon the same principles.

Leeching the perineum is sometimes very successful in relieving pain, and a *small* cupping-glass may be applied over the bites, or warm fomentations to encourage the bleeding, may be tried.

Where there is smart urethral irritation, gleet, or gonorrhœa, the frequent injection of hot or warm water down the passage does good, but astringent or irritating injections are to be forbidden.

The occasional administration of a large saline purgative is most beneficial, and the following mixture may be given in acute cases with benefit:

℞.—Morphinæ hydrochlor. gr. jss.
Potassii acetetis ʒiv.
Tinct. hyoscyami ʒiv.
Vini antimonii ℥j.
Liq. ammonii acetatis ad ʒiv.—M.

S.—One teaspoonful to be taken in half a cupful of fresh barley water four times a day after meals.

Morphine, by the rectum, in the form of suppository, is always indicated for the relief of pain. Should signs of suppuration occur, and fluctuation be distinct, the abscess may be aspirated or punctured by a sharp knife through the rectum, or a free, very deep incision may be made in the perineum with a staff in the urethra, or the left index-finger being placed in the rectum, a double-edged knife may be thrust deeply into the tissues in front of it until pus is reached. Prostatic calculi, if present, should be removed through the incision, and the wound must be daily syringed with an antiseptic solution, and drainage established, if necessary.

In chronic inflammation of the prostate, cold sitz bath. cold enemata, counter-irritation by means of small blisters to the perineum, and the passage of a soft rubber catheter smeared over with unguentum conii, so as to draw off the urine when necessary, and the occasional injection of 5 to 10 minims of caustic solution (1 : 20) to the deep part of the urethra are to be employed. Internally, small doses of boric acid, in conjunction with moderately large doses of tincture of hyoscyamus and ergot may be used.

While attention and treatment are directed to the cause of prostatitis, where this is owing to the following condition, the surgical and medical treatment to be presently detailed must be patiently carried out.

PROSTATE, Hypertrophy or Enlargement of,

Requires varied and very skilful management according to the stage of the disease, and the extent of the enlargement. Cystitis and retention of urine, the former depending upon or resulting from the latter, will require constant attention.

In cases where the enlargement of the gland only leads to a small amount of urine being left in the bladder after the patient thinks he has quite emptied himself by micturition, the symptoms are considerably masked, and the surgeon may long imagine that he has only got a simple case of cystitis to treat. The decomposition of the residual urine sets up grave, local, and constitutional symptoms, and if not promptly and judiciously met, a fatal result too often follows.

In such cases a full diagnosis of the situation is absolutely necessary, and this is comparatively easy. The finger in the rectum will ascertain the presence of the enlarged organ, and the age, generally over fifty-seven or sixty years, will furnish strong and almost conclusive evidence

of the nature of the enlargement. If the patient is now made to empty his bladder as completely as possible, the passage of a soft rubber catheter immediately afterward will demonstrate the amount of residual urine left after micturition.

If the quantity of urine is comparatively small, amounting to under 3 or 4 ounces, the general surgical rule is that the patient should at once enter upon catheter life, and henceforth draw off the urine once or twice or oftener every day, remembering, however, that the mischief is mainly, if not entirely caused, not by the amount of residual urine left constantly in the bladder, but to the changes which sooner or later are set up in the retained fluid. If any means could be obtained whereby these changes could be effectually prevented the patient's life need not, in mild cases, be subjected to the risks and dangers which sometimes follow the daily use of the catheter.

Since the above sentence was written, Reginald Harrison has stated his belief in the necessity of having some residual urine always in the bladder, which in this class of cases has ceased to be able to become a closed space after all the urine has been withdrawn. He emphasizes the opinion that the residual urine should only be withdrawn by the catheter when there is evidence that either by its quantity or its quality it is doing positive harm to the individual, He believes that the sudden and complete emptying of the bladder in these cases has everything to say to the setting up of the so-called catheter fever.

Until within a comparatively recent date therapeutics did not furnish any reliable and safe means for disinfecting the residual urine, and the above surgical law could not be neglected with safety.

Perez, however, found that boric acid when given internally, checks putrefactive changes in the urine; and the writer has found in scores of cases that a few daily doses of 10 to 15 grains of this drug very speedily after the character of fetid urine in chronic bladder affections —(see page 68). In many instances he has found that all the symptoms of bladder irritation rapidly subsided after beginning such treatment, and the high-smelling decomposed secretion which was passed on micturition, gave place to a healthy and sweet secretion, and in several cases as the irritation of the bladder subsided, this organ has so recovered its tone and power that it was able to completely evacuate its contents, notwithstanding the continuance of the enlargement of the prostate. The cystitis necessitating frequent and fruitless attempts to micturate, increases considerably the prostatic trouble by grafting upon the hypertrophy a congestive or inflammatory condition of the enlarged gland. This relief is sometimes, though rarely experienced after beginning catheterization, which so relieves the irritability of the bladder and prostate, as to enable the patient to leave off its use for a long period, and in some very exceptional cases, for the remainder of his life.

With these facts one is often justified in postponing obedience to the above law, and always in mild or recent cases the patient may safely have the benefit of the chance. Where the hypertrophy continues to

advance, and the amount of residual urine increases, and especially when occasional retention supervenes, there is little use in trusting to the simple procedure of rendering the urine aseptic, while grave structural alterations may be slowly taking place in the bladder, ureters, or kidneys, owing to the increased pressure caused by obstructed flow.

Under these circumstances catheter life must be entered into seriously, though occasionally the patient may find that he sometimes is rewarded by such an improvement or amelioration in his symptoms as will enable him for a time, at all events, to lay the catheter aside. In advanced cases, of course, this never happens. Harrison has proved the advantages which follow persistent dilatation by means of a dilator designed for the purpose.

The best catheter for use is the soft vulcanized rubber. When the bladder can be entered by it, the almost invariable advice is given to lubricate and keep this free from germs by carbolic oil.

Oil so acts upon the rubber as to render it brittle or "tearable." and it also destroys its polish. Hence it never should be employed.

For many years the writer has recommended glycerin of borax (made without the addition of water). This is an excellent lubricant, and preserves the rubber in good condition, and it is fatal to all germs. It consists of borax 1 part, and glycerin 4 parts.

The patient should be taught to use the instrument himself at regular and stated times. Where the rubber fails to worm its way along the urethra a plain English gum-elastic catheter, without a stylet, may be used. Large sizes should always be employed. The French *coudé* is a favorite instrument, but the Belfast linen catheter is coming rapidly into favor. Harrison points out the great importance of not having an instrument of large calibre, which empties the bladder too rapidly.

The bowels should be kept constantly free, constipation being always injurious. Food, exercise, and drugs are to be employed as circumstances demand. The occasional use of boric acid (10 grains every morning) and of cascara sagrada (one dose at bed-time) is often all the medicine required.

The following mixture may be used to give tone to the vesicular coats, and to diminish irritability and keep the urine aseptic:

℞.—Tinct. nucis vomicæ ℥iv.
Acid. borici ℥ij.
Tinct. belladonnæ ℥j.
Tinct. hyoscyami ℥ij.
Infus. buchu ad ℨx.—M

S.—One tablespoonful to be taken three times a day after meals, in effervescing potash water.

Washing out the bladder—a constant practice with some surgeons—will be rarely, if ever, required, when the virtues of boric acid internally have become universally appreciated.

Under exceptional circumstances a stream of any unirritating weak antiseptic solution may be passed through the bladder by attaching a

few feet of small rubber tubing to the rubber catheter (making the joint with a small piece of glass tubing). Into the free end of the tubing a small glass funnel is inserted. By this simple contrivance the bladder may be washed out by the patient himself at any time. In some cases, where a catheter must be left in the bladder, the softer rubber instrument is the best, and Browne advises that a leaden stylet is perfectly safe, and it will be found to prevent doubling up of the rubber.

The great majority of cases manage to exist with very little discomfort under the conditions imposed by catheter life; but occasionally even the catheter fails to give relief, and may be passed with difficulty, and when the patient appears to be wearing out with incessant pain and calls to micturate, further surgical interference is demanded.

This must point in the direction of incision into the bladder, and the establishment of such efficient drainage as will give the bladder absolate rest for a time by allowing the urine to flow through it as it trickles from the ureters.

Numerous operations are practised, the boldest of which is that successfully practised by McGill, Kümmell, G. B. Browne, Mayo Robinson, and many others. This is gaining rapidly in favor, and consists in a partial extirpatien of the gland after opening the bladder above the pubes. The operation is known as McGill's supra-pubic prostatectomy.

After opening the bladder the projecting portion of the prostate is removed from the inside by the scoop and finger. Kümmell uses the thermo-cautery for its destruction. After a short time complete relief follows the operation, and the great majority of the cases never afterward require the use of the catheter, the power of micturating being established for the remainder of their lifetime. The supra-pubic opening seldom remains open for any length of time. During the operation the inverted position of the patient should be adopted, and afterward the bladder wound should only be partially closed by sutures. The best dressing consists in the free use of wood-wool pads.

Other measures less formidable in appearance, though not so satisfactory in their ultimate results, are recommended, but none afford the same chance of permanent recovery.

Whitehead establishes a permanent perineal opening after a median perineal urethrotomy. Through this a drainage-tube may be worn, or a catheter passed. McGuire establishes a permanent supra pubic urethra. A permanent supra-pubic fistula and the constant use of a drainage-tube may be tried. The various methods of tapping the bladder by the rectum are not to be recommended, nor is perineal cystotomy to be advocated.

The various methods of removing portions of the enlarged gland through the perineum appear to afford fewer advantages than McGill's plan, and they will probably continue to be employed only under special circumstances.

Belfield, in a valuable contribution, has recently reviewed the suc-

cesses and failures of the operative treatment of enlarged prostate, and dwells upon the published cases where McGill's supra-pubic prostatectomy had failed to remove the growth, and he predicts that the operation of the future will be McGill's operation, or a supra-pubic cystotomy along with a perineal incision, permitting of the stretching and exploration with the finger of the prostatic urethra.

PRURIGO.

The treatment of this affection is most obstinate, and in the severe form described by Hebra it is almost hopeless.

Prurigo senilis, as maintained by Pye-Smith and other dermatologists, is only phthiriasis. This is rapidly cured by the specific treatment mentioned under Pediculi, page 588.

For the ordinary forms of true prurigo, internal remedies, the best of which is cod-liver oil, are necessary. Every measure which increases the constitutional vigor and strength of the patient should be persisted in for long periods. Arsenic, iron, phosphorus, and quinine are drugs which, along with cod-liver oil, may be given for one or two months in rotation. *Small* doses of bichloride of mercury, say $\frac{1}{64}$ grain, may be advantageously given for a fortnight or a month after the temporary suspension of the above remedies. Over-feeding, when possible, should be aimed at.

Some benefit has been obtained by the hypodermic injection of small doses of pilocarpine, of ergot, and, according to Shoemaker, of $\frac{1}{8}$ to $\frac{1}{4}$ grain of hydrochlorate of cocaine.

Local treatment is of considerable importance, and, if carried out with patience and perseverance, the disease may be kept in check in the worst cases, and even in severe cases may be ultimately banished. In children, the management and removal of the disease are, for the for the most part, not difficult.

Warm baths should be given frequently, and these may be made alkaline by adding about half a pound of bicarbonate of sodium to a large bathful of water, or soft soap may be used, the object being to get rid of the increased growth of superficial cutaneous cells which have become dry and dead. After each warm bath, and as much gentle friction as will, without increasing the irritation, cause the removal of the loose layers of the cuticle, the patient's body should be well dried, and an *animal* fat should be thoroughly rubbed in. If this be carried out every night for a considerable period, it is surprising how soon the prurigo will show signs of yielding. Lard, cod-liver oil, and lanolin are the best substances for inunction. The latter is preferable if the patient can get over its disagreeable stickiness. Cod-liver oil is valuable, but its disagreeable odor, which increases after it has become mixed up with the dried scales on the surface of the body, is a great barrier to its use, but in the case of children it certainly is the best remedy.

Gradually the animal fats may be laid aside for an anointing oil, consisting of pure almond oil, 9 parts, and oil of cade, 1 part. Naphthol has been well spoken of.

Scratching is to be avoided in every possible way, and in the case of children woollen gloves should be tied on the hands to prevent injury by the finger nails. Any eczema caused by scratching will require appropriate treatment, and when the pruritus is very distressing any of the remedies mentioned in the following article may be tried. Sedatives at night may be needed, but opium should not be given.

PRURITUS

is constantly mixed up with the above affection, and there is, consesequently, much difference of opinion and confusion about the management of cases. Accepting pruritis as a sensation of continual itching, without the presence of the papules characteristic of prurigo, the first step in its treatment will be to remove any cause, when this can be made out. Diabetes, gout, Bright's disease, jaundice, dyspepsia, and other ailments may be the direct cause, and will afford the true indications for correct treatment; while, upon the other hand, various local causes may be at work, and these should invariably be looked for diligently. Thus, pediculi, scabies, ringworm, and the irritation produced by certain woollen fabrics, may be the cause, upon the removal of which the pruritus rapidly disappears. In other cases it appears to depend upon a neurosis, and must be met by remedies which will tend to depress or blunt the exalted sensibility of the fine nerve endings in the skin, as bromide of sodium in large doses, cannabis indica, tincture of gelsemium, pilocarpine, atropine, ergot, and other drugs.

Shoemaker, who has published valuable researches upon the treatment of pruritis, has obtained excellent results in cases characterized by anæmia and debility, by the hypodermic administration of cod-liver oil, in daily doses of 1 to 2 drachms, injected into the subcutaneous tissues of the back. At the same time, and in all cases, electricity and massage may be relied upon to improve the general condition and afford comfort. Mild local faradization with central galvanism he finds most effective in nervous, prostrated patients. He states "that the electric treatment, combined with proper internal medication, has in my hands ameliorated the condition of many to whom life itself, under the horrible attendant sensations, had become a burden, and has, in very many instances effected a permanent cure after all other treatment had failed."

Baths are of the greatest service. The warm alkaline bath, containing about 8 to 12 ounces of bicarbonate of potassium, generally affords temporary relief, and if used before a good half-hour's general massage its effects are often very marked at bed-time, inducing sleep. Sulphuret of potassium has been used as a bath and found very beneficial, though the writer has generally found it to aggravate matters, owing to the

very common traumatic eczema induced by previous scratching. Nearly every one of the numerous sedative baths used in the practice of skin therapeutics affords more or less relief from the sensation of itchiness. The starch bath is a favorite, and after coming out of it the skin may be dusted over with the dry powder, mixed with salicylic acid (1 : 25).

Of drugs for local application, menthol is the most reliable. It may be used in innumerable ways. Saalfeld dissolves half a drachm of menthol in 1½ ounce of pure spirit of wine, and this may be painted over the affected region in the same way as the writer has brushed the oleum menthæ piperitæ with a camel's-hair brush.

Two drachms of menthol rubbed up with ½ ounce of olive oil and 1 drachm of chloroform may be made into an ointment with 2½ ounces of lanolin.

Cocaine has been extensively employed with success. The ingenious method of Porritt is the best where the region affected is of limited extent. He uses a cone of cacao butter impregnated with 2 per cent. of cocaine. As this is rubbed over the irritating patch the warmth of the skin melts the butter, which forms a soothing, emollient shield over the irritable nerve endings in the skin.

Machiavelli combines various drugs with the cocaine. The following is an elegant and valuable formula where the itching is bad at night:

℞.—Cocaine purif.	gr. iv.
Hydrarg. ammon.	gr. xv.
Zinci oxidi	ʒj.
Vaselini albi	ʒx.—M.

Carbolic acid is often useful. A 1 in 80 lotion may be sponged over the skin at night, or carbolic oil (1 : 20) may be smeared over the body at bed-time, or any firm ointment may be employed. Lanolin, which alone is an excellent sedative in pruritis senilis, may be combined with the carbolic acid.

Creasote is better than carbolic acid, and the following simple combination is excellent:

℞.—Creasoti (beechwood)	ʒj.
Lanolini	℥ij.—M.

The previously mentioned authority recommends carbolate of sodium in persistent itching of the female genitals, in the following form:

℞.—Sodii carbol.	25 grammes.
Eau de Cologne	75 "
Glycerini	100 "
Aquæ dest.	300 " .—M.

This may be followed in bad cases by compresses soaked in the following:

℞.—Cocainæ hydrochlor. 75 centigrammes
Alcoholis. 100 grammes.
Aquæ dest. 300 " .—M.

Verrier for the vulva used the following, applied in the form of tampons in obstinate cases:

℞.—Acid. carbolici gr. ij.
Morphinæ acetatis gr. jss.
Acid. hydrocyanici dil. ♏ xij.
Glycerini purif. ♏ xl.
Aquæ dest. ℥j.—M.

The proportion of carbolic and hydrocyanic acids is quite too small to be of much use in this mixture; it may safely be largely increased.

Julien uses the following in pruritus vulvæ:

℞.—Acidi salicylici ℥j.
Zinci oxidi purif. ℥iij.
Glycerini amyli ℥iij.—M.

The same measures may be employed for pruritus ani; but as this depends so often upon the presence of hæmorrhoids, fissures, or other abrasions, the cause will require removal. (See page 49.)

Tar, liquor carbonis detergens, calomel, camphor, white precipitate, Friar's balsam, borax, chloral, corrosive sublimate, iodoform, naphthol, petroleum, bismuth, nitrate of silver, sulphur, tobacco, salicylic acid, alum, zinc carbonate, tannin, lead salts, acetic acid, etc., are examples of drugs which have been found useful in local and general pruritus.

Formulæ for pruritus might be multiplied to the extent of the present volume. Enough has been given to show the principles upon which relief of the itching may be obtained.

For local pruritus, especially of the anus and female genitals, the writer has discarded every drug save the unguentum conii. This very often acts like a charm. Sometimes he has added to it the following:

℞.—Creasoti purif. ♏ xxx.
Cocainæ purif. gr. xij.
Unguent. conii ℥j.—M.

At bed-time a small *cold* water should be given, after which the parts should be freely smeared over with hemlock ointment, some of it being pushed up in the vagina or rectum by the finger. This often speedily relieves even in diabetes.

In obstinate cases of vulvar itching, a weak continuous current is of undoubtedly great value. (See under Anus, Pruritus of, page 49.)

PSEUDO-HYPERTROPHIC PARALYSIS—See Paralysis, Pseudo-Hypertrophic (page 587).

PSOAS ABSCESS.

Under Abscess the treatment of chronic varieties like the present has been already discussed. As a rule, Lister's method of treating psoas abscess upon the strictest antiseptic lines is the one which should invariably be adopted when the case comes before the surgeon prior to the discharge of the pus. There is no urgent reason, in the great majority of cases, for hasty action. The writer once was prevented making a free incision into a large psoas abscess which had already implicated the deeper layers of the skin. During the night the abscess burst into the bladder, and a rapid (almost immediate) recovery resulted.

Aspiration should be discarded, and a free incision should be made just above Poupart's ligament or in the loin. When the abscess is intra-abdominal the most rigid antiseptic precautions should be maintained, and the abscess-cavity kept aseptic from the beginning to the end of the treatment; and when this precaution is taken, a rapid healing up of the entire cavity may be fairly expected. In extra-abdominal cases the abscess should be opened at the most dependent point. In all cases thorough drainage should be established by tubes under Listerine dressings.

Where full antiseptic precautions are impossible or useless, or where the skin is already perforated, the opening may be enlarged, and the cavity washed out daily with some bland antiseptic solution, as boric acid. This is unnecessary in aseptic cases.

Pitts lays great stress upon the necessity for loin drainage, and after opening the swelling in the groin by a small incision, he makes a large counter opening in the loin. He dwells upon the almost uniform success in dealing with psoas abscess, more particularly in children, which follows the carrying out of this method.

The after treatment of these cases gives good scope to the physician, and the general lines for their management will be such as will be suitable for most scrofulous or debilitated patients recovering from exhausting diseases; thus, diet is to be as generous and varied as the patient can partake of. Tonics, especially iodides, iron, and quinine, with cod-liver oil, abundance of fresh air, and removal to a bracing sea-side resort, with the exhibition of whatever special remedies, appear to be indicated in the case.

As a rule, the patient should not be confined to bed, as the upright posture favors drainage, but rest in bed or suitable plaster or poroplastic jackets will be indicated in cases depending upon disease of the vertebræ. In cases originating in caries or necrosis of the pelvic bones, the surgeon should attempt to remove all sequestra from the abscess, of course under strict antiseptic management.

See under Abscess, page 14, for the methods of Wile, Bruns, Verneuil, and others. These have been successfully applied in a modified way to the treatment of the varieties of psoas abscess. Under Tuberculosis will be noticed Lannelongue's plan of injecting solution of chloride of zinc into the tissues surrounding spinal and other abscesses.

PSORIASIS.

The constitutional treatment of psoriasis with our present knowledge is a simple matter, as in very many cases the patient appears to be in robust health, and there is no indication whatever for drugs beyond the presence of the eruption. It is true that sometimes anæmia is present, and hence the recommendation to give iron. Some authorities still regard psoriasis as evidence of a gouty or scrofulous diathesis, and recommend treatment accordingly, but, as a rule, such drugging, based as it is, upon a wrong hypothesis, only leads to disappointment and mischief. Diet should be such as will be best calculated to maintain a perfect standard of health, and the fancy dietaries insisted upon by some specialists are as useless as they are irksome to the patient.

Drugs which are supposed to have a specific action upon the disease when administered internally are:

Arsenic.
Phosphorus.
Iodide of potassium.
Chrysophanic acid.
Turpentine and copaiba.
Tar water and carbolic acid.

Arsenic stands easily at the head of this list. It has so frequently been proved to be of the greatest service that it should be always selected in preference to any other drug, and only after it has been found to fail is the physician justified in resorting to other agents. It must be commenced in small doses, say 2 minims of Fowler's solution, which should be steadily increased until 5, 7, or even 10 minims are given three or four times a day, diluted with water immediately after or along with food. The drug may be pushed until the physiological effects are noticed, and after redness or irritation of the conjunctiva the dose may be diminished or suspended for a short time, This treatment may be continued for a many months and should not be stopped upon the removal of the eruption. The Asiatic pills, each containing $\frac{1}{15}$ grain, the liquor sodii arseniatis (1 : 100) or the liquor acidi arseniosi (1 : 100) in the same doses as Fowler's solution, may be given. One-twelfth grain of the arseniate of iron three or four times a day may be prescribed in the form of pill, Shoemaker reports success by giving the soda solution hypodermically, $\frac{1}{10}$ to $\frac{1}{2}$ grain of the salt, dissolved in water being injected daily into the deep cellular tissue of the back or buttocks.

Phosphorus is believed by some to possess a specific effect upon the

disease, and the writer has occasionally seen good effects follow its administration in doses of $\frac{1}{3^{1}_{2}}$ grain in pill immediately after food.

Iodide of potassium has recently been given in heroic doses (in ordinary quantities the writer has found it to fail always). Haslund gives very large doses, and Luisani has even exceeded these, and reports a rapid cure in a chronic case by commencing with 45 grains daily, and pushing the drug until 225 grains (nearly ½ ounce) were daily administered. The recent reports show that this drug is worth trying, but there is not yet data for an expression of opinion about its permanent value, though the immediate effects are striking. The limit of 100 grains daily need not be exceeded. Gutteling gives up to 2 ounces of the drug daily.

The iodide may be given in large doses, in combination with arsenic, and the writer has given the following:

℞.—Potassii iodidi ℥ij.
Liq. potassii arsenitis ℥iv.
Glycerini purif. ℥jss.
Aquæ camphoræ ad ℥viij.—M.

S.—One dessertspoonful (2 drachms) to be taken after meals three times daily in a wineglassful of water.

Each dose of the above will contain half a drachm of the iodide, and the total daily allowance will fall short of 100 grains.

Chrysophanic acid or chrysarobin has been given internally with some success, but it often produces violent vomiting, diarrhœa, and griping, even in doses as small as ⅛ grain in pill. Nevertheless, the writer has seen benefit from it, and believes it worthy of a trial *in those cases of psoriasis guttata where its external application is impracticable.* Where it can be applied freely to large scaly patches be believes that its internal use is unnecessary.

Kobert dwells upon the importance of selecting chrysarobin for internal use instead of chrysophanic acid.

Copaiba, turpentine, antimony, colchicum, carbolic acid, creasote or tar, sulphur, alkalies, cantharides, and various diuretics, purgatives, alteratives have been vaunted, but beyond correcting some temporary or accidental complication they cannot lay claim to any specific action.

Cod-liver oil always does some good in the treatment of the affection in children, and in lean adult subjects it often appears to assist the action of arsenic or phosphorus.

The local treatment of psoriasis is of more importance than the constitutional. Morris teaches that it is a local and not a constitutional affection, and every physician can recall examples of the disease successfully treated by agents locally applied. In practice it will be wise no matter what local applications are used to persist in the internal use of arsenic at the same time. Warm baths and hot packs are of the greatest use in softening the scales before applying local agents, and in many instances they are essential.

Of all local remedies the writer still believes that chrysophanic acid or chrysarobin affords the best chances of success in the greatest number of cases. The following extract from the fifth edition of his work on *Materia Medica and Therapeutics*, page 400, will convey his experience and judgment upon the value of the drug:

"It is a remedy whose value in chronic psoriasis can hardly be exaggerated. An ointment of from $\frac{1}{3}$ to 1 drachm, mixed *intimately* with 1 ounce of heated lard or vaseline, rubbed twice daily into the scaly patches of this disease, rapidly causes their disappearance. It frequently produces a painful erythematous inflammation of the surrounding healthy skin, which prevents its use by some patients. The writer after considerable experience of chrysarobin, is satisfied that this need never occur if the application be confined exclusively to the diseased islands, *and not permitted to touch the healthy skin.* This little point he believes to be the secret of the success of the treatment. Dr. Fox has advised application of chrysarobin made into a paste with water, smeared over the spots, and covered with collodion; traumaticine will be found even more satisfactory.

"It acts both locally and constitutionally. Its local action may be seen by rubbing the ointment into the diseased spots on one side of the body of a patient affected with psoriasis. In a week or ten days the skin on the side so treated shows decided signs of improvement not in the least apparent on the opposite, and as the diseased patches begin to disappear under the direct application of the remedy, those regions to which it has not been applied eventually begin to show signs of improvement also; and the writer found by persistently continuing the application to the spots originally so treated, the entire surface of the body cleared up. This is probably caused by its absorption into the system and its conveyance to all the diseased areas. The experiment is not an easy one, however, owing to the difficulty of preventing the ointment being diffused over the entire cutaneous surface, and the application cannot be too long continued, because an ointment which causes no irritation whatever for a few weeks, so long as the spot to which it is applied remains scaly and diseased, soon acts as a powerful irritant to the same spot as it becomes resolved and healthy.

"This observation is strengthened by the experiments performed by Lewin and Rosenthal upon rabbits. They found that an ointment of chrysarobin, when applied externally, was absorbed and partly converted into chrysophanic acid in the system. A part not oxidized was demonstrated in the urine.

"The deep purplish discolorations which it produces on the skin and bed-linen are barriers to its use, and great care must be exercised in applying the ointment to the face, as it causes œdema of the eyelids, with discoloration, though it can be applied to the scalp (15 grains to 1 ounce) with benefit.

"Brooke's salve sticks are a splendid way to use chrysarobin. Lie-

bermann finding that chrysarobin had such powerful affinity for oxygen, thought that its action depended upon this, and that in its oxidation to chrysophanic acid it robbed the parasites of their oxygen and killed them. He has discovered an almost identical substance, which he now uses instead of chrysophanic acid."

This is anthrarobin, which has been successfully employed in several cases as a 10 per cent. ointment, which may be applied to the face and eyelids, though it leaves a yellow stain. It is safer than pyrogallic acid. It may also be painted on as a 15 per cent. tincture, after scrubbing with soap and water to remove the scales.

The writer has obtained the best results by painting the affected patches with a paste of the acid made by rubbing it up with water or spirit, and over this applying a piece of rubber adhesive plaster. In using the salve sticks the greased spot may be similarly covered over. By these means several points are gained: 1. Only the diseased patch is subjected to the action of the drug, the healthy skin being untouched. 2. More concentrated preparations can be applied. 3. The action of the drug upon the diseased spot is continuous. 4. No soiling of linen or bedclothes or discoloration of the face occurs. Unna and Stelwagon use the acid in the form of medicated plasters. These are very valuable for large patches.

Of the most recent methods of employing chrysophanic acid or chrysarobin locally, the most elegant and efficacious is the glycerinum saponatum mentioned on page 231. Hans Hebra adds 10 per cent. of chrysarobin to the 92 per cent. mixture; this is known as his chrysarobin glycerinum saponatum.

Tar is the local remedy which has still the highest place in the treatment of psoriasis, among the majority of skin therapeutists; and with many skilful physicians the following epitome of the treatment of the disease would be endorsed: Give arsenic internally; remove the scales by bathing, packing, or scrubbing; rub in the ointment of tar, and make the patient sleep in his tarry underclothing.

The tar treatment may be carried out in many ways. The liquor carbonis detergens may be made into a less objectionable ointment than the official unguentum picis liquidæ. Two drachms to 1 ounce of lanoline may be used, or it may be mixed with spirit lotion, 1 : 10, which can be applied upon lint and covered with oiled silk or thin mackintosh; or the liquor may be brushed in its full strength over the spot and be allowed to dry.

Oil of cade or juniper tar, is a more agreeable preparation than the pix liquida obtained from the pinus sylvestris. It may be mixed with oil or used as an ointment (1 to 4 of spermaceti ointment), or the following excellent application may be used:

℞.—Olei cadini } Equal parts.—M.
Ceræ flavæ }

Make an ointment with the aid of heat.

Vidal makes the oil of cade into a soap with an equal quantity of glycerole of starch and 5 per cent. of soft soap. This is rubbed in every evening and washed off in the morning.

Various other tarry preparations are in use, and Hutchinson combines the tar and chrysophanic acid plans in an ointment containing 10 grains of white precipitate, 10 grains of the acid, and 10 minims of liquor carbonis to 1 ounce of benzoated lard. This is perhaps the best of all tarry applications in psoriasis.

Hot baths, which are so valuable in the treatment of psoriasis, are an essential part of a successful tar cure. The patient should lie in a large warm both for 30 to 60 minutes, during which time he may apply gentle friction by a piece of soft flannel or by a soft brush to the scaly patches until the epithelial products are removed. The addition of an alkali like the bicarbonate of sodium or potassium, to the extent of about 4 ounces to a moderate sized bath, is a great advantage. After coming out of the bath and getting dried he should roll himself up in a blanket until the cuticle loses its retained moisture, after which any of the tarry preparations just mentioned may be freely rubbed in.

Some authorities, as Hebra and Kaposi, advise the application of green soap daily until the scales are removed and a raw oozing base becomes visible. The spiritous solution of the soap may be rubbed in with strong friction, or the patches may be scrubbed with soap and water by the aid of a brush. Ellinger employs sand to remove the scales.

The writer has never seen any benefit follow these painful measures. When he wishes to get the scaly patches cleansed he resorts to the warm alkaline bath and local wet packs. Large patches soon yield to a pad of lint soaked in water or a weak alkaline lotion, covered by oiled silk, and kept continually in its place by comfortable bandaging.

After such preparatory treatment the action of local remedies is much more rapid and satisfactory, and some physicians content themselves with these ablutory measures, and the internal use of arsenic, assisted by diuretics or diaphoretics. Where baths are not obtainable, Jamieson recommends that an ointment, consisting of 10 parts of carbonate of ammonia, 25 of lanoline, and 50 of cold cream, be applied daily to remove the scales, which it most effectually does.

Creolin (5 parts), vaseline (100 parts); thymol (1 part), lard (20 parts); naphthalin (1 part), lard (8 parts); creasote (1 part), lard (8 parts), ichthyol (50 parts), vaseline (100 parts); beta naphthal (1 part), lard (9 parts); pyrogallic acid (5 to 10 parts), lard (100 parts); and for extensive surfaces Besnier uses the following paint:

℞.—Acid. pyrogallic } āā gr. xc.
Acid. salicylic }
Æther. et spt. vini rect. q. s.

Mix and add

Collodii flexil. ℥ijss.—M.

Pyrogallic acid is, undoubtedly, very efficacious; but its use appears to be not without danger, as two fatal cases are reported. Jarisch used an ointment of 1 drachm to the ounce, but a much weaker preparation may be used with great safety; 15 to 20 grains per ounce is perfectly safe and unirritating, but it should not be applied to the entire body, as its absorption may give rise to alarming fever, strangury, and melæna. It stains black or dark brown, but weak ointments may be safely applied to the head and face.

Vleminckx's solution (pentasulphide of calcium) is applied by rubbing or dabbing it into the affected patches with a strong brush or flannel until the skin bleeds, after which it is washed off, and cold cream or lanolin applied.

Shoemaker gives the following formula of Wilkinson's ointment, as modified by Hebra:

℞.—Sulphuris sublimat. } āā ℥ss.
Olei cadini }
Saponis viridis } āā ℥j.
Adipis præp. }
Cretæ præp. ℥ijss.—M.

Hebra also used the following mixture, which is a very valuable application in chronic cases with large isolated scaly patches:

℞.—Picis liquidæ }
Spt. vini rectif. } āā ℥j.—M.
Saponis viridis }

Mercurial preparations are used, and upon the bacterial theory there has been a revival of the treatment by weak ointments of bichloride (1 : 50), biniodide (1 : 50 to 1 : 100), ammoniated (1 : 15). Nitrate, as citrine ointment and the oleate (10 to 20 per cent.), have been recently advocated.

Rochard's ointment consists of:

℞.—Hydrarg. chlor. mitis ℥ss.
Iodi purif. gr. xj.
Unguent. simplicis ℥xiv.—M.

Shoemaker, in hospital practice, uses the following:

℞.—Unguent. hydrarg. nitratis } āā . . . ℥ij.—M.
Unguent. picis liquidæ }

In private practice he recommends an ointment made by diluting the officinal ointment of the nitrate or oleate of mercury with one-half or two-thirds of lard or butter, adding half to one drachm of either naphthol or chrysarobin to each ounce.

Turpentine, iodide of sulphur, iodide of lead, and pure iodine have been also used.

There is not yet sufficient data to enable one to arrive at a conclusion regarding the values of hydrochlorate of hydroxylamine, hydrochlorate of hydrazine, or hydrazine salicylic acid, or of aristol—the new thymol derivative.

Above are the most frequently employed combinations, though formulæ might be given without end, each specialist having his favorite combinations. In the treatment of a diseased condition like psoriasis, which varies little in its characters, and cannot be well said to have "stages" in its progress, as is the case with eczema, the great mistake which the student is sure to make is to begin with a local application, and before it has had time to act change it for another, and so on all through the progress of the disease. Selecting either the tar or chrysophanic acid, it will be much better to stick to it all through in every case until experience proves that it is not going to give satisfactory results. Life is too short to attempt to gain an experience of the result of every special application, and it requires years of patient watching and observation in order to thoroughly master all the little minutiæ required in the successful use of any one of the above remedies.

Electricity used either as the constant, interrupted, or static current has been reported as giving good results in several cases when locally applied, and it need not interfere with any of the above applications.

PTYALISM.

Increased flow of saliva is but a symptom of various affections, and its treatment will depend upon the cause which, when diligently sought out, is to be met by appropriate remedies. Thus, various local, tongue, or mouth affections, as delayed dentition or aphthous stomatitis in children and secondary syphilitic affections in adults, may cause the salivation, which will be readily checked by treating the primary cause.

When ptyalism is caused by the administration of a mercurial, it should be instantly stopped in the great majority of cases, for, as already pointed out, it will be seldom necessary to cause salivation during the treatment of syphilis or any other affection by mercury. With the suspension of the drug the increased flow of saliva, as a rule, speedily subsides, but sometimes profuse salivation of a degree difficult to control may be met with where mercurials have been administered by quacks. The best local application will be chlorate of potassium (1 : 40), which should be used as a mouth-wash every hour, after first cleansing the buccal cavity with a weak solution of the permanganate of potassium. Before and during a course of mercury the greatest attention should be paid to the state of the gums and teeth in order to prevent ptyalism. This is most carefully attended to at Aix and is one of the details upon which the great success of the treatment there depends.

When in ptyalism from excessive mercurialism the gums become much swollen and ulceration has occurred, astringents will be required.

Alum (1 : 40), chloride of zinc (2 grains to 1 ounce), tannic acid (1 : 40), decoction of oak bark, or other vegetable astringents may be used. The overwhelming fetor may be met by weak solutions of chlorinated lime or soda, or by a mouth-wash consisting of carbolic lotion (1 : 80) or iodine (½ of tincture in 40).

The glycerin of borax is a most efficient local application, but it must be used almost continuously.

Internally the chlorate of potassium may be given with advantage, and if combined with a mineral acid or iron preparation containing a free acid a better effect will be obtained.

Stimulants may be needed in bad cases, and only liquid food can be swallowed.

When ptyalism is the result of some reflex action, the amount of saliva can be easily diminished by the internal administration of atropine, belladonna, hyoscine, or opium in small doses, given until dryness of the throat occurs. It is, as a rule, not advisable to give atropine in cases like mercurial salivation, or where ptyalism has been produced by iodine or other drug. In these instances the increased salivary flow is probably caused by an attempt on the part of nature to cause the elimination of the poison. The writer, acting upon this theory, has utilized the powerfully stimulating action of pellitory root upon the salivary glands in order to encourage the flow of saliva. Several quarts of the secretion may be caused to flow away in this manner, but where the gums are swollen and ulcerated this plan should not be adopted.

Iodide of potassium has been given in mercurialism with some benefit, but it is a questionable experiment to try it, as it may greatly aggravate the affection.

Bromide of potassium has proved useful in the salivation of pregnancy. It may be combined with small doses of belladonna or hyoscyamus.

PUERPERAL CONVULSIONS.

There must ever remain differences of opinion regarding the best treatment of any affection until its pathology is cleared up; and in the present state of our knowledge there are widely diverging views upon the pathology of eclampsia occurring in connection with the later months of pregnancy. The treatment which is based upon the theory that the disease or condition is a purely functional affection, or as regarded by Santos, merely an "acute peripheral epilepsy," is as highly efficacious and as reliable as the treatment based upon the theory that the eclampsia "depends upon uræmic poisoning due to an inadequate secretory activity of the kidneys," as maintained by Spiegelberg. Hence, forgetting all theories upon the subject, the physician is justified in adhering to the remedies which a wide and extensive experience has proved to be most valuable.

Prophylactic treatment is of importance, and experience has shown that in those cases of pregnant women who exhibit large amounts of albumin in the urine, attention to the conditions of the kidneys is likely to materially diminish the tendency to eclampsia. The skin, bowels, and kidneys should be made to work with activity and efficiency, as already detailed in speaking of the treatment of Bright's disease.

One of the most powerful prophylactic measures is a diet consisting exclusively of skim milk. This diet might be supposed to act equally well whether the eclampsia was the result of an epilepsy or of uræmia, since it is one of the best remedies in either diseases when unassociated with the puerperal state. Auvard recommends the milk diet strongly, and Blanc advises full doses of chloral as a prophylactic where there is much albumin.

The question of inducing labor, or hastening delivery, if labor has already commenced, will have to be discussed. *During pregnancy* it may be laid down that interference in this direction is seldom needed, and as Spiegelberg points out: 1. The convulsions may subside without interrupting pregnancy. 2. If severe, labor will set in *sua sponte*. 3. All the mild proceedings which would suffice for provoking pains are too slow in their action, while those that operate more rapidly irritate the uterus too greatly, forced delivery being forbidden under these circumstances.

When labor has already commenced, or is about commencing, there need not be any hesitancy about hastening it; in severe cases this must be carried out with rapidity and firmness, the expectant plan of treatment being then abandoned. The steps to be taken will depend upon the stage of the labor already present, and the condition of the os and cervix.

As a rule, rupture of the membranes will be the best procedure, after which mechanical dilatation of the os with the fingers, and in rare cases, where the convulsions are very severe, the os may be incised. Where, notwithstanding, the puncture of membranes and dilatation of the os or cervix, labor does not proceed as quickly as the urgency of the symptoms would render necessary, delivery must be accomplished by version or the forceps, and the placenta should be taken away without undue waiting, but anything like precipitancy should be avoided.

Though the induction or hastening of labor has been mentioned at the beginning of the remarks upon treatment, it is not to be understood that it is the first thing to be achieved, or that other remedies are to be withheld until it is accomplished. Upon the contrary, these are to be rapidly pressed into the service before the rupture of the membranes is performed, or during the period that the dilatation of the os is being accomplished.

Blood-letting is undoubtedly of the most unquestionable utility, the rapid reduction in the blood pressure which follows having a very marked effect upon the frequency and severity of the convulsions, but

as the disuse of blood-letting has at the present time caused the operation, which at one time was considered a very trivial one, to be regarded in a serious light by most practitioners of the present day, the majority of whom have never seen it performed, it is seldom done for puerperal eclampsia. Other measures equally efficacious are, however, available.

Chloroform inhalation, to the extent of producing deep narcosis, is an agent of great value in eclampsia; and statistics show excellent results since the introduction of this method of treatment. Ether, or other anæsthetic, may be tried where chloroform is not available.

Next in value to the chloroform treatment is that by chloral, which should be pressed in large doses when the patient is able to swallow between the attacks, or it may be given by the rectum in all cases with advantage, either alone or in combination with the bromide of potassium—20 grains of chloral and 40 of bromide being injected every three or four hours in severe cases.

The best practice is to give chloroform by inhalation, and to keep up the effect by chloral and bromides per rectum. If this be done cautiously, the chloroform can be suspended until the immediate premonitory symptoms or signs of a convulsion are experienced, when the chloroform sponge may be immediately placed over the patient's mouth and nose.

Winckel's results from this combined chloroform and chloral method of treatment amounted to a death-rate of only 7.6 per cent.

Where the symptoms do not readily yield to these remedies, especially in very plethoric subjects, the physician should not hesitate to open a vein in the arm by a *free* incision, and let out 15 to 20 ounces of blood. After blood-letting, should the convulsions return, chloroform must be very cautiously given, if at all, and unless they are very severe, it will be well to suspend both the chloroform and chloral, and trust to enemata of bromide of potassium (1 to 2 drachms) and hypodermic injections of morphine. Some authorities always combine morphine with the chloral treatment, and give nothing else, but it is very probable that this method will not give as good results as the chloroform and chloral plan. In some cases all these remedies have been successfully employed when the convulsions have been very formidable.

Trousseau's method of compressing the carotids often stops, or very materially modifies the attack, and though not to be entirely depended upon, it may be advantageously employed in most cases to gain time until the chloroform narcosis is established.

While the above measures are being used, and labor is being hastened, the physician should not omit to stimulate the excretory organs, and the ordinary treatment so successful in dealing with uræmia may be safely pushed after delivery has been accomplished. As already detailed, this is based upon the lines of causing rapid elimination of the retained excrementitious products, as urea, leucin, tyrosin, etc.

Purgatives of the saline class, the best of which is the sulphate of magnesia, or compound jalap powder, are to be freely given. Elaterin or elaterium has so often failed in the writer's hands in critical cases that he prefers to trust the ordinary salines.

The skin must be acted upon powerfully. The best of all means for this purpose in puerperal eclampsia is the free use of the wet pack.

Pilocarpine has been so frequently found to cause œdema of the lung that Jaggard, Phillips, Spiegelberg, and others wisely caution the profession about its serious dangers. The writer prefers nitrite of amyl or nitro-glycerin where a rapid effect is necessary. Ordinary diuretics are not to be depended upon. Large doses of caffeine have, however, been very beneficial.

The writer has chanced to meet with puerperal convulsions in several cases *after* delivery had been accomplished in the normal manner, and in these eliminatory treatment was most satisfactory, free purgation by sulphate of magnesia and jalap powder, with the hot mustard pack or mustard blanket bath, acting rapidly and effectually.

Blanc's discovery of a microörganism—a slender bacillus—in the urine of patients affected with puerperal eclampsia would point to the importance of eliminatory measures.

In desperate cases, the best treatment will, in the opinion of the writer, be that suggested by Bozzolo for uræmia, and mentioned upon page 75. It will consist in the removal of a fair quantity of blood by opening a vein in the arm, after which weak saline solution may be injected subcutaneously or into a vein, with the view of diluting the remaining blood left in the body. (See, also, under Anæmia, upon page 38, for the details of the methods of injecting salines.)

PUERPERAL FEVER.

In the treatment of this formidable affection, prophylactic measures are of primary importance. These may be summed up in two words —absolute cleanliness. The patient, her house, bed linen, and surroundings should be as clean as possible. The hands, dress, and instruments of the accoucheur and of the nurse must be placed beyond the possibility of conveying microörganisms. Antiseptics are of vital importance, but the accoucheur should not be led into the error of relying upon them solely. Cleanliness of the most scrupulous degree is all that is necessary. When this has been achieved in every detail, antiseptics or disinfectants may then be used to render "assurance doubly sure."

In order to carry out this system, a rigid examination of the patient's surroundings should be made. There is little use in the scrupulous cleanliness of the attendants if the lying-in room should chance to be in direct communication with a sewer, or if friends and visitors are promiscuously admitted to her chamber laden with the germs of puerperal fever, erysipelas, or scarlatina.

Dr. Byers, in a valuable paper appearing in the *Dublin Monthly Journal*, May, 1891, proves by recent statistics the great importance of making as few vaginal examinations as possible, and of using as a prophylactic dilute sublimate solution.

The irrigation of the vagina during labor, especially after vaginal examination, is of great importance, and the examinations should be as few as possible. After careful cleansing of the hands and arms of the attendant by soap and water, they may be rinsed in a weak carbolic lotion (1 : 50), or in a dilute solution of the permanganate of potassium. Either of these may be used as a vaginal douche.

Bichloride of mercury—the most powerful germ destroyer—has been very much used of late years, a solution of 1 : 1000 being employed as an antiseptic solution for the hands and instruments. The serious mishaps which have been known to follow its routine use, especially as a vaginal or uterine douche, have led to its now being much less frequently selected.

The vagina should be invariably irrigated after delivery, and Speigelberg lays down the rule that if the hand had been introduced into the uterus its cavity should be well washed out.

Though it is not generally considered necessary in Germany, where antiseptic midwifery is the rule, to daily wash was out the vagina after labor with antiseptics unless where there are considered to be special reasons, the writer invariably follows the practice of having the canal irrigated twice a day for the first fortnight, and as he has never had a case of puerperal fever occurring during the last sixteen years; he thinks it possible that it may be owing to this precation. There is no danger or drawback to the practice if carried out by a skilled nurse, provided that weak permanganate solution, about 1 ounce of Condy's fluid to a quart of tepid water, be used, and if the vagina pipe be not passed up into the uterus. Sometimes severe pain and shock follow the injection of fluids into the uterus when there is no outlet for the flow, and when undue pressure is maintained. The practice of securing the expulsion of all clots from the uterine cavity after labor by prolonged kneading, and the administration of ergot are universally recognized as valuable prophylactic measures.

When symptoms of septic poisoning actually occur as evidenced by pyrexia, rigors, etc., the vaginal irrigations, if not already in use, should be commenced. A 2 per cent. solution of carbolic acid may now be used, and under special circumstances double this strength may be safely employed. Every eight hours the vagina may be washed out by the nurse, and once a day the physician should pass a tube up into the uterus, and thoroughly cleanse its cavity under a low pressure, and taking care not to introduce air. Schücking carries out a system of *permanent* irrigation. Deipser disregards all ordinary antiseptics, and relies upon a stream of *hot water* (122° F.) for six days after delivery. The Russian method of constant irrigation of the *vagina* by a stream of hot carbolic lotion (120° F.) has been reported as giving excellent

results. The apparatus of Morosow is used. The Italian practice is to *continuously* irrigate the *uterus* by a stream of carbolic solution by means of a Breus-Bozeman-Fritsch tube or Kurz catheter, the flow being kept up for hours until the temperature falls.

In this country the accoucheur has generally been satisfied to use the uterine douche once a day for the first four or five days after pyrexia appears - substituting in some cases for the carbolic a lotion of bichloride of mercury 1 : 4000. The douche tin with rubber tubing should be preferred to the ordinary Higginson's syringe.

When, notwithstanding the thorough disinfection of the uterus and vagina, the deepening of the symptoms show that the virus has reached the general blood stream, other measures must be adopted.

Fever will claim attention. When this is moderate and the symptoms only indicate a minor degree of septic poisoning ordinary diaphoretics are indicated, but when a persistent high temperature is recorded, quinine in large doses is indicated. Ten grains may be given every four or six hours until the full physiological effects of the drug are produced, or a dose of 30 grains may be given at once.

Antipyrine and antifebrin have both given excellent results as far as reduction of temperature is concerned, and where quinine fails and the method next to be mentioned is not feasible, they may be used with great advantage. It would appear that though the new antipyretics have forced quinine almost out of use in every other severe pyrexial conditien, in the treatment of puerperal fever it has still maintained its supremacy, notwithstanding that it often fails even in 20 or 30 grain doses to affect the temperature. In cases where it thus fails in reducing fever heat it is felt nevertheless to have done good as a tonic and stimulant, and hence its popularity in a disease characterized by profound prostration, and often associated with grave cardiac weakness.

In severe hyperpyrexia quinine is useless. Even the certainty and rapidity of the new antipyretics are not to be depended upon, and the patient will speedily sink unless the fever heat, which is incompatible with life, be soon subdued by the only reliable agent—cold water. This may be used as the cold wet pack, in which the patient's entire body is submitted to the action of water at 60° F. or lower by being enveloped in a wet sheet. If the physician pours cold water continually over the wet sheet all the advantages of a cold bath are obtained, but there is no doubt that to plunge the patient into a cold bath, or tepid bath afterward gradually cooled down by the addition af cold water, is the most rapid and efficient antipyretic treatment that can be devised. Even in puerperal fever, life may be saved by its means. The duration and frequency of the bath or pack will depend upon the height of the temperature and the influence which it exerts upon its reduction, and also upon the symptoms exhibited by the patient, the general management of the remedy differing in no way from its use in the ordinary continued fevers.

Alcohol alone, or in conjunction with the bath or other antipyretics,

is of the greatest value, but it must be given with no sparing hand where the symptoms of cardiac failure and general exhaustion call for its employment. The writer believes that most satisfactory results will be obtained from 5 grain doses of antipyrine every two hours, alternately with 4 to 8 drachm doses of whiskey—that is, one or other remedy being given each hour in milk or strong beef tea.

Blood-letting is practically out of the question.

Purgatives have been employed in the early stages where there is no evidence of peritoneal mischief, and their antipyretic action is sometimes well marked; 5 grains of calomel may be given, followed by 4 or 6 drachms of Rochelle salt.

Warburg's tincture has succeeded in the reduction of fever heat and all its attendant evils when every other remedy has been known to fail. It can be used in collapse when other antipyretics are contra-indicated. Half an ounce may be administered at one dose, and this may be repeated in three hours again.

Tinctures of digitalis, veretrum viride, and aconite have been recommended, but the results do not warrant their use in a disease where collapse and cardiac failure are often prominent features. Even digitalis as an antipyretic is useless, except in doses which may seriously tell upon the cardiac muscle.

Salicylic acid, the purified salicylate of sodium (of Charteris), and the tincture of eucalyptus globulus are safe, reliable, and agreeable antipyretics, which can be used when quinine and antipyrine disagree.

Turpentine has long enjoyed a reputation in the treatment of puerperal fever, and it may be tried with some hope of success in conjunction with the measures already mentioned. The form of capsule is the most agreeable and efficient, and 15 minims may be given every four or six hours. It may also be given by inhalation, the air of the patient's apartment being saturated with it by pouring the spirit of turpentine upon the surface of *hot* water. It may be advantageously given in the form of enema when there is much tympanitis, and in the form of a stupe or fomentation. It is an efficient and agreeable counter irritant when applied to the tense abdomen.

Beyond the treatment of symptoms as they arise, and the reduction of fever heat when this threatens life, little can be done after the onset of symptoms which prove that the case is one of true puerperal fever, save to employ every possible means whereby the patient's strength can be kept up by the most sustaining liquid dietary.

Special symptoms must be met by appropriate remedies. Pain is to be combated by opium in full quantities, the amount and persistency of the pain being the guide to the doses. Pain, as in peritonitis or pleuritis, may be relieved by poulticing or by hot fomentations, by cold compresses, or by hypodermic injections of morphine near to the seat of the suffering.

In the peritoneal form of puerperal fever the treatment will be the same as for the general condition, plus such local anodyde measures as

the symptoms indicate. Vomiting must be controlled by ice and rectal feeding. Leeching is recommended in these cases, but the result is very questionable in a disease where every drop of blood which the patient possesses is required in the struggle against the septic organisms. The same remarks apply to calomel and the inunction of mercurial preparations.

These remarks do not apply to cases of pure puerperal peritonitis, where the constitutional disturbance appears to be only secondary to the localized peritoneal inflammation. In such cases the remedies useful in puerperal fever may be administered, as quinine, alcohol, *opium in large and frequently repeated doses*, cold compresses, or Leiter's tubes, or hot poultices, leeches, calomel, and other remedies indicated in peritonitis (which see, page 607).

The question of opening the abdomen and washing out the peritoneal cavity has been solved by experience both in true puerperal fever, with peritoneal complications, and in true puerperal peritonitis, and little encouragement can be obtained from a perusal of the reported results. To be of any use in puerparal fever the operation must be done at such an early stage as would cause most men to hesitate recommending it. In those cases where there is a clear diagnosis of an inflammatory attack, confined to the pelvis or abdomen, without the constitutional element of general infection, an operation may not only be advisable, under certain circumstances, but it may be the only means whereby life can be saved.

PUERPERAL MANIA

The prognosis being so good, the duration of the attack being generally so short, and the chance that in some cases sudden and rapid restoration to sanity occurs, all lead the physician to advise the trial of home treatment before resorting to an asylum.

The most easily managed cases, as a rule, are those occurring soon after labor, and such may fairly be expected to recover within two or three months, or less. Obstinate cases must ultimately be sent to special institutions possessing every administrative machinery for coping with all difficulties in carrying out moral treatment. The first question which may crop up will be the one of suckling. As a rule, the mother should not be permitted to nurse her child. In rare cases this may appear so simple and easy that the patient's relatives may insist upon it, but the physician should warn them that dangerous impulses may suddenly seize the patient at any moment, and that she should not be trusted with the custody of the infant for a moment, nor should she be allowed to remain alone under any circumstances.

Every possible source of excitement should be avoided, though it is very doubtful if the old method of confining the patient to her bed in a darkened room should be followed. Firmness, stillness, and perfect rest, are to be maintained, and the infant should be removed from the room as soon as the patient appears not to be excited by its

removal, and, as a rule, it should be kept entirely away from her until recovery is established, or until she expresses a desire to see it again. One or more good nurses are essential, and the friends should leave the case entirely in their hands under the supervision of the medical attendant.

The ordinary functions must be closely seen to, the bowels, bladder, and stomach being watched, and any indigestion or vomiting, constipation, or retention of urine, should be remedied. The diet should be generous, but light, as much milk, good soup, or other liquid nourishment as the patient can be caused to swallow being administered at short and regular intervals. Forced and rectal feeding may be necessary. Sleep must be procured, but opium, morphine and chloral are to be avoided. *The* drug is sulphonal in full doses in such cases, and 30 grains may be given at bed-time, and repeated in six or eight hours. It may be sprinkled between two slices of bread and butter, or given between the layers of a jam sandwich, or, where a quicker effect is desired, it may be dissolved in boiling water, and swallowed hot.

Ice or cold compresses to the forehead, with a sinapism at the back of the neck, assist the action of the hypnotic. Leeching of the temples and other debilitating measures are to be condemned.

Alcoholic stimulants are, as a rule, to be avoided, but in weak and anæmic subjects, especially those who have had much hemorrhage during or after labor, a good, sound claret may be given with food in liberal quantities. Should any increase of excitement be noticeable after alcohol it should not be repeated, but a tonic containing quinine, combined with small quantities of digitalis, may be substituted for it.

Bromides are most valuable in the treatment of the chronic stages where acute exacerbations of excitement occur, and iron in some form or other is generally indicated before the patient's restoration to health. It is needless to say that the condition of the vagina, uterus, and ovaries should receive the closest scrutiny, and any departure from health should be remedied, but the practice of making frequent vaginal examinations is to be strongly censured.

In mania or insanity following prolonged lactation, the weaning of the child should not be delayed, and the chief indications will be a liberal and highly nutritious diet, with free alcoholic stimulants, especially good ale, porter, or stout, and judicious moral treatment. The condition of the uterus will demand attention, and as subinvolution will often be found in connection with anæmia, both general and cerebral, the indications will be for iron in large amounts, with quinine and ergotine, as in the following pill:

℞.—Ext. ergotæ gr. j.
Ferri reducti gr. iij.
Quininæ sulph. gr. ij.—M.
Make 36 of these pills.
S.—One pill to be taken after meals three times a day, and at bed-time.

PUERPERAL PERITONITIS—See under Puerperal Fever (at page 729).

PURPURA.

In mild cases of simple purpura the patient may be allowed to move about. His diet should be mixed and very generous, and he should have a mixture like the following:

℞.—Liq. potass. arsenit. ℥ss.
Tinct. ferri chlor. ℥iijss.
Glycerini ℥j.
Aquæ camph. ad ℥viij.—M.

S.—One tablespoonful to be taken three times a day in water, after meals.

As a rule, the use of the above will be speedily followed by improvement. In severe cases of so called simple purpura, rest in bed is essential, and large doses of iron are still believed to be the best remedy; but in all serious cases and in purpura hæmorrhagica iron is not to be relied upon, except in the anæmic stage following large hemorrhages.

W. B. Richardson, who describes an "aqueous" variety of purpura hæmorrhagica, treats it with fresh animal food, diminished amount of fluids, and frequent purgation, giving, at the same time, a mixture containing superphosphate of iron combined with peroxide of hydrogen. In the "scorbutic" variety he advises the same treatment as is indicated in scurvy, and in the vascular variety he relies upon turpentine.

Where hemorrhages from mucous surfaces are present the case must be regarded as serious, and absolute rest in bed insisted upon. The air of the patient's apartment must be saturated with the vapor of turpentine, which is also to be given in the form of capsule, and when the hemorrhage amounts to any quantity ergot must be given freely. The hypodermic injection of 1 or 2 grains of extract of ergot may be resorted to several times daily. The room should be kept very cool, excess of bedclothing must be avoided. The diet should consist of cold milk and cold beef jellies; constipation and purging are both to be equally avoided. Stimulants are to be given with caution.

According to Muskett, Eustace Smith recommends the following draught every morning or every second morning to a child six years old:

℞.—Olei terebinthinæ ℥ij.
Olei ricini ℥ij.
Mucilag. tragacanth. ℥iij.
Syr. limonis ℥ss.
Aquæ menthæ pip. ad ℥j.—M.

S.—To be taken in the morning.

Where the hemorrhage continues after the use of this draught, he gives a mixture containing 3 or 4 minims of Fowler's solution and 15 minims of tincture of iron, three times a day, freely diluted with water, after meals, to a child of the same age.

. Where ergot fails in controlling hemorrhage, other agents may be employed, as acetate of lead, alum, tannic or gallic acids, tincture of larch, sulphuric acid, or hazeline, and any of the remedies mentioned under hemorrhage. Ice and any of the above may also be employed locally where the bleeding part can be reached, as about the nose and fauces. Plugging may be needed.

Poulet has recently reported most glowingly of the effects of small doses ($\frac{1}{5}$ grain in bread-crumb twice daily) of nitrate of silver. If his results are corroborated this will prove the best remedy we have. The writer tried this drug recently in a severe case where nearly all the previously mentioned agents had failed, and rapid improvement followed. There was nothing to lead him to believe that any improvement was likely until after the silver had been administered.

In the later stages tonics are indicated, and strychnine is of great value, combined with quinine, as in Easton's syrup.

Complications which arise from the effects of internal hemorrhages are to be dealt with on general principles, and under some circumstances opium may be needed.

Faradization of the entire surface of the body is reported as having saved life in severe hemorrhage from purpura.

When occurring in rheumatism, after large doses of iodides, or when undergoing the "raw meat cure," or in scurvy or other conditions, the indications for treatment are clear. The above remedies are only to be relied upon after the cause is removed or combatted.

PUSTULE, Malignant—See Malignant Pustule.

PYÆMIA.

Like the treatment of puerperal fever, this form of septic poisoning calls for preventive measures, and in the vast majority of instances preventive treatment is as completely successful as ordinary treatment is valueless in the fully-established disease.

The most rigid antiseptic treatment locally will be required in dealing with wounds and injuries, and absolute cleanliness and free drainage in all cases where an aseptic condition of the injured part is impossible. Pure air is of vital importance, and free ventilation must be maintained; but the overcrowding of patients together in surgical wards will not be sufficiently met by ventilation alone. An abundant cubic air space must be supplied to each case. The wounds must be thoroughly irrigated with antiseptics, and every trace of retained secretion must be washed out in this way, and, by free incisions, giving vent at the most dependent parts, and by the insertion of drainage-tubes retention of decomposing pus should be rendered impossible. Tension by these

means cannot occur, and the frequent changes of the antiseptic dressings will prevent decomposition in the secretions.

Gentleness in manipulation of skin wounds and in dealing with compound fractures is essential, and it is not necessary to say that sponges, soiled bandages, and every possible source of conveying germs from putrefying pus must be rigorously avoided. The bowels, bladder, and kidneys—in fact, all the excretory organs—should be kept in a state of activity.

Internal accumulations of pus, especially when in connection with inflammation of bone, should be incised freely and early. As for drugs in the prophylaxis of pyæmia, there is certainly some efficacy in saturating the system of the patient with iron.

Many years ago, when the writer was house surgeon and superintendent of a large hospital, he was satisfied that the routine rule which most of the surgeons adopted in putting every case with skin wounds or those for operation upon full doses of tincture of iron, had an appreciable effect in diminishing the risks of septicæmia, erysipelas, and pyæmia. This was before the introduction of the antiseptic method, when these affections were common. When pyæmia has once developed its characteristic symptoms, the prognosis is most grave, and little is to be expected from treatment in the great majority of instances.

The question of secondary amputation, disarticulation, or the removal of any suppurating portion of the limb, or of the method practised by Lee of dividing any inflamed accessible vein between the heart and seat of original injury has been tried, and in some instances with success, when the operation was undertaken with promptitude in the very early stages.

The treatment of all wounds should be the same as in the preventive stage, and every local accumulation of matter should be incised as soon as possible, the cavities washed out, and suitable drainage with antiseptic dressings applied frequently.

Abscesses in joints should be opened at as early a stage as possible, washed out, drained, and dressed antiseptically, as if ordinary abscesses. The same remarks will apply to collections of pus in the pleura or pericardium. Every complication must be treated upon general surgical principles, in which the freest and most abundant supply of fresh and pure air is never to be forgotten. It is certainly worth while to attempt to surround the patient with an antiseptic atmosphere, and the writer has done this by making a muslin coverlet, and having it filled with teased-out oakum or carbolized tow, which is to be kept on the top of the patient's counterpane. Over this, after a brief period, as it loses its virtue by evaporation, turpentine, creasote, thymol solution, or eucalyptus, or other volatile antiseptic may be sprayed or sprinkled from time to time. Much can be done for some cases by diet and medication. The diet should be the most sustaining possible, and liquid nourishment should be pressed upon the patient with the view

of sustaining his vital powers to the fullest extent with the hope, that if kept alive for a time, the suppurative process may exhaust itself.

Alcoholic stimulants are valuable, but they must be given with no sparing hand. The writer can recall cases in the pre-antiseptic period which were saved apparently by almost unlimited amounts of whiskey and port. Whiskey may be given with the milk, and half an ounce every hour is not a large amount when the very serious aspects of the cases point to its administration. A full dose given with some *hot* water at the commencement of the rigor affords relief, and often cuts short its duration.

Of drugs, various antiseptics have been given, and the remarks applicable to the drug treatment of puerperal fever apply here. Quinine in full doses gives best results. The newer antipyretics act upon the temperature with greater certainty and precision, but quinine appears to be of value, even when it fails to reduce the fever heat.

The following combination may be given:

℞.—Quininæ sulphatis ℥jss.
Tinct. ferri chlor. ℥j.
Glycerini purif. ℥j.
Aquæ camphoræ ad ℥xvj.—M.
S.—Two tablespoonfuls to be taken, with as much water every eight hours.

Iron, in full doses, is of great value in chronic cases. Salicin, salicylate of sodium, resorcin, iodoform, sulphites, sulpho-carbolates, permanganate of potassium, creasote, turpentine, iodine, iodol, salol, and various other germicides have been administered internally as well as used locally, but with results which warrant little hope of success.

PYELITIS

The treatment of suppurative inflammation of the pelvis of the kidney will depend almost entirely upon the cause, and since this varies so greatly the treatment will necessarily be very various and the same remedies will seldom be indicated in any two cases, but there are some remedies which may be useful in all cases after the primary cause of the pyelitis has been removed.

Where calculi in the pelvis of the kidney have been the cause of the affection little can be expected until these have been removed (see under Stone in the Kidney), though some relief may be afforded by measures directed to the correction of any abnormal condition of the chemical constitution of the urine. When the affection is secondary to enlarged prostate, vesical calculus, gonorrhœa, chronic cystitis or tumors in the bladder, etc., the removal of the cause will lead to rapid subsidence of the pyelitis. When caused by cancer or tubercle nothing but palliative treatment need be thought of. Occurring during scarlatina, typhus, typhoid, smallpox, Bright's disease, diphtheria, diabetes, scurvy, or purpura, these affections will require appro-

priate treatment. Certain poisons or drugs, such as cantharides, turpentine, copaiba, etc., will cause pyelitis, which for the most part rapidly subsides after they have been discontinued.

In acute cases where the cause cannot be determined or removed, absolute rest in bed is essential, and the free administration of bland mucilaginous drinks. Poultices, or hot sitz baths, warm fomentations, or all three combined may be used to relieve pain. Cupping, after the application of a dozen leeches to the loin, may be necessary. Mild diuretics, like the citrate of potassium, formed by giving a plain solution of bicarbonate of potassium in effervescence with fresh lemon juice, may be administered, but, as a rule, the use of ordinary diuretics, like squill, digitalis, copaiba, broom, etc., are to be condemned, and even buchu, uva ursi, pareira, and triticum, are to be given with caution.

In some cases where the urine is markedly alkaline the mineral acids may be tried, but, as a rule, little need be expected from them. Boric acid is always safe and sometimes acts like magic, especially in those cases, acute or chronic, which have arisen from the extension of bladder mischief along the ureters.

Pain may be relieved by hyoscyamus in full doses of the tincture in preference to opiates.

In chronic cases the chief indication will be to diminish the secretion of pus, and to support the patient in every possible way by good feeding, cod-liver oil, pure air, improved digestion, change of scene, etc. Stimulants are to be given with caution.

Of remedial agents next to the removal of the exciting cause boric acid, in doses of 15 grains three times a day, is by far the most efficient.

When severe pain is present, it may be given in the following form:

℞.—Acidi borici gr. x.
Codeinæ gr. $\frac{1}{3}$.
Sodii salicylatis gr. x.—M.

Make 24 of these powders.

S.—One powder to be administered in half a tumblerful of effervescing potash water every six hours.

Creasote, in the form of capsules each containing 1 minim, is of service, so also is quinine in full doses, 5 grains three times a day, combined with 30 minims of any of the mineral acids largely diluted. Sulphide of calcium has had a reputation in diminishing or checking the suppurative process within the body. It does not appear that it has any marked effect in modifying the suppurative action in pyelitis.

Oil of eucalyptus offers a much more hopeful result, and it is much less likely to irritate than turpentine, which is the remedy still recommended by many authorities.

Tannic acid, benzoate of sodium, alum, iron alum, acetate of lead, hydrastis, ergot, cantharides, and various other drugs are recommended, but their action is very doubtful. Perhaps the best effects after boric acid, if it fails, will be got by large doses of the tincture of chloride of iron.

In some cases the operation of nephrotomy is the only hope of saving the patient, the kidney being incised through a skin wound made along the outer border of the erector spinæ muscle, and thorough drainage established under strict antiseptic precautions. (See also under Hydronephrosis, page 374.)

PYELONEPHRITIS.

Arising from similar causes as are at work in pyelitis the suppurative process may attack the substance of the kidney. The treatment will be the same as that already mentioned under Pyelitis.

PYONEPHROSIS.

Where the passage of the ureter becomes blocked and pus accumulates in the dilated pelvis of the kidney above the obstruction, the surgeon need not hasten to evacuate it. There is some reasonable hope that if the main line of treatment detailed under Pyelitis be rigidly carried out the purulent contents of the sac may dry up, and the entire organ be transformed into a semi-solid, harmless, inert putty-like mass, which in process of time may shrivel up into a membranous sac without any vestige of renal tissue in it.

Where the tumor points, or where there is any chance of its emptying its contents into the peritoneal cavity or bowel it should be treated as an abscess upon general surgical principles and evacuated.

Unless in urgent cases or for diagnostic purposes, aspiration is to be condemned. A free incision, with strict antiseptic precautions, should be made at the outer edge of the erector spinæ muscle, midway between the crest of the ilium and the last rib. From this wound all accumulations in the pelvis may be evacuated under the spray of carbolic lotion, and calculi or tumors may also be cleared out. A long rubber drainage-tube, with a broad flange on it, should be inserted deep into the sac, and the most efficient drainage secured.

If, after a very considerable period, the wound shows no signs of healing owing to the continuance of free purulent discharge, before matters get too grave the patient should have the chance which a complete removal of the diseased organ will afford.

PYO-PNEUMOTHORAX.

The treatment of this condition will be that of the empyema with which it is associated. (See under Empyema, page 236.)

PYOSALPINX.

Various plans have been suggested for the relief or cure of suppurative inflammation of or purulent accumulations in the Fallopian tubes. Often through the matter finding its way into the uterus and being discharged, relieving the patient permanently of further trouble, the like result may be hoped for before resorting to formidable operations. When the symptoms are acute, absolute rest in bed, with anodynes and very copious and very hot vaginal injections, are indicated as in acute metritis.

In very chronic cases, where the degenerative changes in the lining membrane of the uterus has led to closure of the uterine end of the duct, the plan adopted by Doleris may be tried before resorting to laparotomy. The os is opened up by antiseptic tents, the interior of the uterus, and especially its Fallopian orifices, are thoroughly scraped by means of the curette, and antiseptic drainage established after packing the uterine cavity with iodoform gauze soaked in glycerin. This plan is very serviceable in simple catarrhal salpinx.

The plan of using Brandt's massage with the view of emptying the contents of the tube into the uterine cavity is so fraught with danger as to be unjustifiable. In cases where it is certain that the uterine end of the tube is patent this procedure may be practised, but at the best it is of very doubtful value.

Electricity by Apostoli's method has been extensively practised, and with marked success in some cases. The faradic current of tension he uses only in acute cases as a rapidly acting sedative, and the faradic current of quantity he considers only as indicated rarely in some very chronic cases. For the majority of cases the intra-uterine application of galvanism is indicated, and according to the strength of the current used any effect may be produced from a mere alterative action to thorough and complete galvano-cauterization. It is this last result which is aimed at so as to cause destruction of the mucous membrane as effectually but more safely than by the curette as just described. The positive pole should be introduced into the uterus at first, and the negative only after several sittings. Every five days, 5 minutes of galvano-cauterization, with a current commencing 50 and reaching 150 milliampères, may be administered.

Where the above measure fails, the operation of vaginal galvano-puncture is indicated. Apostoli says that "almost every salpingo-oöphoritis will be amenable to appropriate electrical treatment. It is sovereign in the catarrhal salpingites, calming in the tuberculous salpingo-oöphorites, and capable of curing certain purulent forms of salpingo-oöphoritis by the establishment of vaginal drainage." The latter result is obtained by burying for the depth of less than half an inch a small sharp steel trochar in the part of the inflammatory tumor which is most prominent in the vagina, avoiding the anterior *cul-de-sac*.

The positive pole should be first employed, and later on, especially

when a vaginal fistula is desired, the negative should be employed; a current up to 250 milliampères may be used. The strictest antiseptic precautions are necessary, and rest in bed is essential.

McClure, instead of the galvano-puncture, prefers the metal ball electrode (negative) covered with wash leather, and applied *per vaginam* directly to the mass to be acted upon, using a current of up to 100 milliampères for ten minutes every three or four days.

Various operative measures have been practised by surgeons, the most recent of which is that practised by Skutsch, who removes the contents of the tube after puncturing with a Pravaz syringe. If the contents are clear and free from pus, he opens the ostium and cuts out of the wall of the tube in its vicinity a small oval piece, and unites by sutures the mucous and serous membranes around the aperture thus formed. In cases of pyosalpinx, he sutures the end of the diseased tube in the abdominal incision.

The tubes may be removed by a small abdominal incision, and if any of their contents escape, the peritoneal cavity must be thoroughly irrigated and drainage established. Some operators have removed the tubes *per vaginam*.

When the tubes are bound down in the pelvis by adhesions which would render their entire removal by abdominal section hazardous, the plan which has been successfully practised by several surgeons may be tried. The tumor in this case may be aspirated from the vagina, but as a rule this will give but temporary relief, the fluid soon accumulating again. The best practise would seem to be to make a free incision into the tumor from the vagina, and wash out the cavity with a mild antiseptic, and inject afterward with iodine, establishing drainage when necessary.

PYROSIS—See Dyspepsia.

QUINSY—See Tonsillitis.

RABIES—See Hydrophobia.

RACHITIS—See Rickets.

RANULA.

Upon the whole, the most satisfactory method of dealing with these cysts is to snip out a small window-like piece of the cyst wall and mucous membrane in the floor of the mouth, and pack the cavity with a little absorbent wool soaked in iodine (1 : 20), strong solution of chloride of iron, or chloride of zinc, with the view of exciting inflammatory action.

The opening may require to be enlarged with the scissors if it closes too rapidly. The writer has treated many small ranulæ by simply removing as much of the anterior wall as possible with a fine, sharp-

pointed pair of scissors, and leaving the gap to close up by natural means. Excision of such cysts is most difficult, and rarely necessary; and the establishment of a permanent fistula is equally difficult in some cases, unless Dupuytren's seton instrument be used. In congenital cases the cyst may be tapped and rubbed with the solid nitrate of silver.

RAYNAUD'S DISEASE.

The uncertainty about the pathology of this form of gangrene renders a rational method of treatment difficult. The object should, as far as possible, be to determine the underlying cause of the arterial spasm, and remedy it by appropriate agents. Thus, in the cases where a syphilitic history is evident, the condition has rapidly disappeared after the exhibition of anti-syphilitic remedies, and where Bright's disease, diabetes, alcoholism, injuries to the abdomen, meningitis, mania, emotional disturbances, exposure to cold, leprosy, hæmatinuria, etc., are probably exciting causes, these conditions should be met by the recognized remedies. The local treatment will depend upon the condition of the affected parts. (See Gangrene.) In Professor Smith's interesting case the treatment consisted in the administration of 10 grain doses of antipyrine for the first three days, and afterward, of a mixture containing arsenic and strychnine every six hours.

RECTUM, Cancer of—See Cancer.

RECTUM, Inflammation of—See Proctitis.

RELAPSING OR FAMINE FEVER.

As the name implies, this scourge is associated with starvation in most epidemics, and the treatment must be chiefly sustaining. Though distinct from typhus, it management may be briefly described as that which would be suitable in a smart attack of that fever occurring in a broken-down patient.

Abundance of liquid and easily digested food, administered *cautiously at first;* Alcoholic stimulants, to be given as indicated by the pulse and collapse; quinine, for the high temperature; and rest in bed after the fall in the fever, and the steady administration of every sustaining agent, so that, if relapse occurs, the patient may be well prepared for the further drain upon his vital powers, are generally all that will be necessary to tide the patient over the attack.

Dysenteric and pulmonary complications are indications for the continuance of quinine and alcohol. In future epidemics it may be found that the intense pain in the back and head may be safely relieved by small doses of antipyrine, and that hyperpyrexia may be promptly reduced by the cold bath.

REMITTENT FEVER.

The treatment of this affection is to be conducted upon the same general principles as are indicated in intermittent fever. The sovereign remedy being quinine in large doses, any other preparation of cinchona may be substituted in special cases with more or less advantage; but the sulphate of quinine is the one still most generally used, and it may be given by the mouth or rectum. In the early stage of the disease, until the occurrence of the first remission proves to the physician the nature of the disease with which he is dealing, ordinary diaphoretics, as spirit of nitrous ether, alone or combined with small doses of tincture of aconite, will probably suggest themselves, or moderate doses of antipyrine may be used. A good purge—5 grains of calomel—is a favorite dose with those experienced in dealing with the early stages of suspected malarial fevers.

Once the remission has occurred there should then be no time lost in administering quinine; 30 grains should be given in divided doses of 5 or 10 grains inside an hour. When vomiting is severe and incessant 30 or 40 grains may be given by the rectum. This dose will occasionally be all that is necessary in mild cases, and may effectually prevent further exacerbations; but, as a rule, it will be advisable to keep the patient under its influence for some time, and for this purpose some physicians begin with 5 grains of quinine, and continue this dose through fever and remission until cinchonism is produced. When given during the exacerbation vomiting is much more likely to occur, and many prefer to only give the drug during the remissions, continuing it until the fever ceases to rise. Upon the whole, perhaps, the best plan is to give one dose of 20 grains during the remission, and to keep up the effect by doses of 5 grains during the exacerbations as long as the temperature keeps high.

Hyperpyrexia, which sometimes occurs in severe cases, will not be met by quinine. The newer antipyretics or salicylic acid may be tried; but it is wiser, in the face of a (rising) temperature above 106°, to resort without delay to the cold bath or cold pack. Warburg's tincture is often useful in cases where these remedies are not permitted.

Collapse, vomiting, diarrhœa, intense headache, restlessness and other complications of symptoms, are to be met by remedies which, under the same circumstances, would be indicated in typhus or typhoid fevers. It is needless to say that bleeding, leeching, purging, mercurialization, emetics, and other lowering treatments are not to be thought of. Arsenic is of use in the later stages.

RENAL COLIC—See Stone in the Kidney.

RENAL DISEASE—See Bright's Disease, Pyonephrosis, etc.

RETENTION OF URINE.

For the relief of a distended bladder the hot bath and catheter are the appropriate remedies. The history of the case will generally give at once some idea of the cause. Thus in a patient in advanced life with a history of failing power in emptying the bladder, and in the absence of a history of stricture, enlargement of the prostate is almost certain. Here, as already mentioned under Prostate, Enlargement of, page 707, the surgeon should attempt to pass a pure vulcanized rubber instrument of about the size of a No. 8 or 9 (English). The catheter should not be passed until the patient has been placed in a hot bath, and often micturition occurs in hospital cases especially after twenty or thirty minutes in the bath. When the rubber instrument fails, the gum-elastic or French coudé may be tried. The writer, after failing with the rubber, generally finds that a large-curved silver instrument is the best in acute cases. With skill and *confidence* this weapon will seldom fail in entering the bladder. The novice is almost certain to try the smaller sizes, but a No. 10 long (English) silver catheter with a wide curve is the proper instrument.

Regarding the plans for passing it safely into the bladder little need be said, as a little experience is worth volumes of written directions. The catheter should be rendered aseptic inside and out, and it should be well oiled, and the greatest patience and gentleness are essential, and sometimes the introduction of the left index-finger into the rectum will greatly assist the passage of the instrument.

Where the difficulty of introducing an instrument is very great, especially when some previous operator has succeeded in making a number of false passages, it will be necessary after its introduction to tie in the instrument for a time (the tying in of a silver catheter is, when *possible*, to be avoided).

When getting into the bladder is impossible, after reasonable patience has been exercised, and where the patient urgently requires relief, his bladder may be tapped by the aspirator above the pubes—a simple and safe operation, after which often a rubber catheter can be then passed through the urethra and tied in for several days, antiseptic precautions being attended to. (See under Prostate, Enlargement of, page 706.)

Where the retention is the result of stricture, and the history of the case leaves no doubt of the diagnosis, the surgeon should keep clearly before his mind the pathology of this affection. In this lies the secret of successful treatment. A few hours before the attack of retention probably the patient passed his urine freely, though in small stream. The element of *spasm* and *swelling* of the urethral mucous membrane from some recent chill or irritant is the exciting cause, and affords the explanation of the sudden blocking up of the urethral canal.

When time permits, these causes should, if possible, be combated by a *hot* bath and a full opiate before resorting to the use of the catheter.

After the failure of these the patient should be put to bed, and a No. 1 or 2 gum-elastic instrument without a stylet should be passed down to the stricture, and with patience and gentleness it may be coaxed through. After the opening up of the anterior portion of the stricture, the writer has often succeeded in passing in a No. ½ or a No. 0. Where these fail a No. 1 silver instrument may be tried, but in inexperienced and rough hands this is a dangerous weapon, as every hospital house surgeon knows. When the bladder is entered and the urine drawn off, the instrument should be tied in, and the greater the difficulty experienced in passing it, the more reason is there for tying in the catheter, so as to avoid further irritation when the bladder again fills. After a few days a larger instrument may be passed and tied in, and the routine treatment for stricture may be then commenced.

Where the bladder cannot be relieved by the urethral route, it may be punctured with the aspirator needle above the pubes, or a suprapubic opening may be made by a long curved trocar and canula, which may be retained for a few days, or the bladder may be opened by the rectal route, or by the button-hole perineal opening, known as the operation of Boutonnière. (See under Stricture of the Urethra, Urinary Fistula, etc.)

Where the retention is caused by a small impacted calculus this should be removed by suitable forceps, or if too close to the bladder, a gum-elastic or silver catheter may be gently worked past it.

Where swelling or inflammation of the urethra, as in gonorrhœa, is the cause of retention a very *hot* bath and a warm urethral injection of distilled water with a smart saline purge, and, if necessary, leeching the anterior portion of the perineum may be tried, after which a rectal injection of 30 minims of laudanum or the introduction of a morphine suppository may be resorted to. In unyielding cases a medium-sized soft-rubber catheter may be introduced.

In hysterical retention, or in retention owing to temporary paralysis of the bladder, as in fevers, and after accidents or opium, a soft-rubber catheter is the best instrument for drawing off the accumulated secretion. Where nothing complicates the hysteria, the use of the catheter should not be resorted to until moral treatment, the free use of the cold douche, and other anti-hysterical remedies have proved unsuccessful.

RETINITIS.

In simple inflammation of the retina little can be done but to insist upon absolute rest and the exclusion of light, and mild counter-irritation above the brows or on the nape of the neck, and to search diligently for the constitutional affection upon whose presence the retinitis depends and treat it.

In albuminuric retinitis the treatment should be directed to the condition of the kidney, and the various remedial measures are detailed under Bright's Disease, upon page 78.

In syphilitic retinitis small doses of the bichloride of mercury, after a course of iodide of potassium, will afford the best hope of cure or amelioration.

In the pigmentary form the mildest continuous current often does good.

RETINAL DETACHMENT.

The treatment of this troublesome affection is often most unsatisfactory and tedious. The only cases where any very marked improvement may be confidently expected are those in which the patient comes early under the physician's care; and under these circumstances the course to be pursued is clear. Rest is the one most important and essential element in treatment. The patient should be confined to the horizontal position in a darkened room, with a moderately tight bandage over the eye. Diuretics and saline cathartics may be advantageously used, and when the amount of sub-retinal fluid is large a puncture should be made in the outer coat of the eyeball and the fluid drained off. There does not, however, appear to be much benefit from this procedure after the reaccumulation of the dropsy, though when adopted early in large extravasations the results are good.

Pilocarpine in full hypodermatic doses has certainly been followed in some instances within the writer's knowledge by very marked improvement. The *full* physiological action of the drug must be induced and the injections repeated daily or every second day for many weeks.

RETROFLEXION AND RETROVERSION — See Uterus, Displacements of.

RHEUMATIC ARTHRITIS (Chronic).

If treatment be commenced early much may be done for this obstinate malady. In a fair percentage of cases the joint troubles may be caused to entirely disappear, but this need never be expected unless the patient can be completely removed from his surroundings and transported to a drier atmosphere, where the variations of temperature are less marked than in this changeable climate—a warm, dry, equable climate being acknowledged on all hands to be an essential factor in successful treatment.

As a winter resort, Algiers, Egypt, and Italy are suitable, while in summer Baden-Baden and Weisbaden and other Continental resorts are popular. In connection with these places the baths are of great importance, but these will be mentioned later on.

Clothing and diet are also of vital importance. As regards the former, the body should be encased in light woollen garments, worn, if possible, next the skin, but overclothing is to be avoided. The writer advises a thin flannel vest and drawers, with a piece of wash-leather inserted inside the fabric next to the skin, over the large joints, as at

the shoulders, elbows, and knees. The practice of piling on garment over garment, so as to keep the patient always in a state of perspiration, is to be condemned. The feet-wear is not to be neglected, and cork insoles are essentials in wet weather. All undue exposure to cold and damp, it is needless to say, should be avoided, and the patient should be advised, if possible, not to expose himself during the prevalence of east winds.

As regards diet, everything which tends to improve nutrition must be freely given. No matter which of the various views of the pathology of the affection may be accepted, there is always evidence of serious impairment of nutrition, and this calls for the most liberal and varied dietary. Mixed food—fresh meat and plenty of fresh vegetables—with a very limited supply of malt liquor or none at all, should form the basis of food.

Celery, eaten raw or stewed, is a popular remedy, and experience proves that there is some truth in the belief, though the writer thinks that the Spanish onion is the best of all vegetables for constant use by the victims of this affection. In Ireland, where the disease is so very common, it is probable that the excessive use of bacon has something to answer for in inducing the disease.

Fats are an important item in the dietary, and above all other foods or drugs stands cod-liver oil. It should be regarded not as a medicine, but as a food, and, in conjunction with the extract of malt, should be given at the termination of every meal.

In hereditary cases, when rheumatic or arthritic pains first show themselves in the offspring of parents in whom the disease is well marked, this food or drug should be pushed. The writer has seen good results from this remedy even in obese subjects.

Sometimes an impression has been made upon the disease by a prolonged trial of a purely vegetarian diet.

Every error or departure from the normal standard of health must be carefully sought for, and remedied as soon as discovered. Thus, prolonged mental exertion, worry, super-lactation, menstrual disorders, frequent pregnancies, and renal disease, may be found to be the exciting causes.

Medicinal treatment in the more acute form of the disease may be tried upon the lines laid down in Acute Rheumatism, but, as a rule, the salicylic compounds are of very little use, certainly of no *permanent* use whatever. Those writers who report great benefits from their administration probably do not differentiate carefully between acute or sub-acute rheumatism and rheumatic arthritis. In the North of Ireland, where this latter affection is seen not rarely in hospital in a more or less acute form, a differential diagnosis may generally be made by watching the failure of the salicylates, which are almost certain to speedily relieve articular rheumatism.

Alkalies are always of some use, and large doses of iodide of potassium may be combined with them for the relief of the pains in the early

stages of the more acute cases. Antipyrine and quinine, alone or in combination with opium, may be resorted to in such cases.

Various anodyne applications may be used for the relief of pain when this is severe in recent cases.

For the ordinary chronic cases which come under observation only after the disease has existed for some time, there has been a very long list of remedial agents recommended, but if all be excluded save those which have stood the test of experience the list will become a very limited one, and will be made up of the following in their order of merit: cod-liver oil (already mentioned as a food), arsenic, iodine, sulphur, guaiacum, actæa racemosa, and iron.

In conjunction with these, and of considerable value, must be bracketed electricity (the continuous current), massage, various medicated baths and spas.

While great benefit, and even permanent success, follow the use of these measures in some cases, nevertheless one after another of them may be tried in vain. Generally, however, failure may be attributed to the patient who soon loses faith in remedies, and flies from one quack preparation to another until the joints have become hopelessly deformed.

The writer recommends the steady administration of a combination like the following for several months:

℞.—Liq. potass. arsenit. ℥ijss.
Potass. iodidi ℥vss.
Ext. sarsap. fld. ad ℥viij.—M.

S.—One teaspoonful in a wineglassful of water to be taken three times a day after meals.

This may be given in conjunction with a dose of cod-liver oil after dinner and at bed-time.

The syrup of iodide of iron is a favorite preparation, but in the writer's hands it has generally failed. The plain tincture of iodine is better.

The old electuary known as the "Chelsea Pensioner," containing sulphur, guaiacum, rhubarb, nitre, mustard, and honey, often relieves pain and checks the progress of the disease. (See page 430, fifth edition of *Pharmacy, Materia Medica, and Therapeutics.*)

Actæa racemosa, in full doses, often affords some relief. Ringer thinks it acts best in those cases where the uterine functions are disturbed.

The weak, continuous current (15 to 25 Leclanché cells) used twice a day in conjunction with any of these drugs is of much service. The sponge electrodes being well moistened in hot salt and water, one is placed just above the affected joint, and the other over the skin at any part of the limb lower down. Even the induced or interrupted current has been found useful.

Massage often proves valuable, especially in those cases where walking exercise is painful or impossible, and it may be employed along with the use of electricity, but its best results are obtained when it is carried out in the Turkish bath by a skilful operator.

In very chronic cases it is sometimes astonishing to observe the good which may follow simple passive movements of the affected joints, and by this procedure deformity, pain, stiffness, and anchylosis may disappear, even in bed-ridden patients.

Among baths, the warm, sulphurous waters are especially to be commended, and various other saline baths are of undoubted value. Harrogate, Buxton, Bath, and Strathpeffer have their advocates; Aix-la-Chapelle, Aix-les-Bains, Baden-Baden, Wiesbaden, Pyrmont, and many other Continental waters are of great value. The hot brine baths of Droitwich, with massage, are, in the writer's opinion, of the greatest service in many cases, and the good effects may be kept up when the patient returns, by the steady use of the Turkish bath at home during the winter months.

This treatment is of service where all the joints are involved, but the best results are seen in those cases where a limited number of the large and medium-sized articulations are affected.

Hot douches (especially the hot sulphurous douche), cold douches. mud or peat baths, or the bath made by enveloping or burying the affected joints for one or two hours daily in very hot sand, have been recommended, and after their use, passive movements or massage may be tolerated, when these agents were before contra-indicated by the amount of pain and distress produced by the friction and motion.

Of local applications for the relief of pain there is practically no end. Every known form of counter-irritation has been tried, and any application which is capable of causing an increased flow of blood to the skin may be used. Most of the good which has been experienced from local remedies has been the result of the friction and massage associated with their application.

Chilli paste, turpentine, paraffin oil, camphor, ammonia, cajuput or eucalyptus oils, the official liniments of soap, ammonia, compound camphor, croton oil, iodine, mustard, turpentine, or acetic turpentine, may be employed. The liniments of St. John Long and Stokes are popular remedies. Arnica should never be used.

Of local anodynes for the relief of pain, when this is very severe the liniments of chloroform, belladonna, and tincture of aconite in equal proportions applied upon the lint and covered over with oiled silk, is one of the most efficacious. The joints may be wrapped up in a thick layer of absorbent wool, and covered with thin mackintosh, kept in its place by a moderately tight bandage.

New flannel, dusted over with flowers of sulphur, is a popular and valuable remedy when used as a bandage to envelop the affected joints. Chaulmoogra oil, cod-liver oil, oleate of mercury and mor-

phine, and other agents have been used in conjunction with massage, or strapping of the joints with stout plaster.

Where local remedies fail to give relief to the wearing pains of chronic rheumatic arthritis, opiates, antifebrin, antipyrine, exalgine, large doses of bromide of potassium, colchicum, lithium, salicylate of sodium and quinine salicylate, may be tried if the previously-mentioned internal remedies have failed.

RHEUMATISM, Acute.

Upon the first symptoms of pain, heat, and redness in one or more joints, with increased temperature and sweating, the patient should be ordered off to bed without a moment's delay. There is, perhaps, no other diseased condition where absolute rest in the horizontal position is more clearly necessary. Endocarditis, followed by *permanent* valvular mischief, is decidedly less likely to occur in patients who have taken early to bed after the development of rheumatic fever.

The sick room should be selected upon the ordinary sanitory principles, and it is better that it should not be upon the ground floor. The air of the room should be kept at a uniform temperature, and currents of cold atmosphere are to be avoided; hence ventilation by the windows is not advisable. The dry heat given out by a really good Fletcher's gas stove or a Tait's thermic ventilator is a desideratum. The bed should consist of a good hair mattress upon the top of a hard straw palliasse, feather beds being objectionable, both on account of the patient sinking into them and also of his profuse sweating. Sheets (especially linen) must be dispensed with, and it adds greatly to the comfort of the patient if he be placed between light or thin flannel blankets. The bedclothes should not be abundant, and a loose and thin flannel night dress, which speedily absorbs the cutaneous moisture, is to be preferred to calico or cotton. Loosely-fitting drawers of the same material may also be worn. A bed-pan and urinal are essentials. A common pickle bottle makes a convenient urinal.

The diet may with advantage consist entirely of milk, with farinaceous food occasionally, and at a later stage beef tea, soups, chicken jelly, or concentrated beef essences may be administered after the subsidence of joint pains and fever. Thirst may be relieved by small quantities of ice sucked in the mouth, or by the frequent administration of a wineglassfull of equal parts of iced kali water, and milk, or by lemon juice diluted with three or four parts of water. Alcoholic stimulants are not generally required. Cardiac weakness and various complications, such as pleuritis or pneumonia, may, under certain circumstances, call for them in full doses.

Of drugs, there is no remedy equal to the salicylates, and, though some eminent authorities recommend a pure expectant or peppermint water treatment, and publish excellent results from its use, neverthe-

less it is highly probable that these savants would resort very soon to the salicylic treatment, should they themselves be unfortunate enough to become the victims of an acute attack of rheumatism, with its unbearable pains and aches.

Those who recommend aconite, veratrum viride, and cimicifuga have more claim to be heard, and there is no doubt that small doses of these drugs have a decided influence in modifying the fever and alleviating the joint pains. One minim of the U. S. P. tincture of aconite, given as soon as the patient comes under notice, and followed up by ½ minim every thirty minutes for six or eighth hours, often affords considerable relief, and in mild cases appears to cut short the attack, but in many cases such treatment fails entirely.

The writer would go so far as to state that, given a typical case of severe acute rheumatism, the physician is not warranted in withholding the salicylic treatment, and, since those who begin with aconite and other agents generally fall back upon the salicylates, it would appear more rational to lose no time, but to put the patient at once under their influence, and save him all the suffering possible.

The literature of the salicylic treatment since its introduction by Maclagan would fill a small library, and volumes might be made up of statistics attempting to prove its efficacy or its failure in influencing the *duration* of the disease and its effects upon preventing or determining *cardiac complications*. Under the head of Endocarditis these important points have already been referred to, and only brief mention can be made of them here.

It cannot be denied that the salicylic treatment affords the most certain and speedy means by which all the symptoms of acute rheumatism may be relieved, but it must be granted that it still remains to be proven that this treatment has the power of cutting short the actual *duration* of the disease to any considerable extent. As regards the effect upon the cardiac complications likely to occur during the attack, it must again be admitted that clear proof is still wanting to demonstrate that it lessens to any appreciable degree the occurrence of endo- or pericarditis.

By closely watching the cases long after recovery, the writer believes that it may be possible to prove that of a number of patients who have suffered from rheumatic endocarditis, a smaller percentage of those who had received salicylic treatment will eventually develop *permanent* valvular mischief than of those subjected to expectant or other methods. This is obviously a very difficult point to settle, but of late years the results of hospital and private cases (but chiefly the latter) have led the writer to gravitate toward a conclusion in favor of the *permanent* benefit arising from the salicylic treatment.

It does not appear that these remedies prevent relapses, and indeed it would seem upon the contrary that relapses are, if anything, more frequent than when the alkaline treatment is alone used. This may be, however, owing to the patient indulging in exercises or movements

while the pains are in complete abeyance under the influence of the salicylates before the attack has entirely passed off.

The various drugs embraced under the general term of salicylic remedies include salicin, salicylic acid, oil of wintergreen, salicylate of sodium, and salol.

Maclagan recommended salicin, some still adhere to the acid, but the great majority of physicians rely upon the salicylate of sodium, and, upon the whole, it is in many points of view the drug best suited to the great bulk of cases. Salol in full doses is dangerous owing to its high percentage of carbolic acid.

The able researches and invaluable discovery of Professor Charteris, who has isolated a substance from the artificial acid and its sodium salt, which he has experimentally demonstrated as being the cause of certain toxic effects noticed after large doses of these substances, have placed the salicylic treatment upon a surer foundation. Only the acid or its soda salt as purified by his method should ever be used in medicine, and much larger doses than those hitherto employed may now be given with perfect safety.

Thirty grains of the purified salicylate of sodium may be given as soon as the patient comes under observation, and 20 grains may be given every four hours afterward. In twenty-four hours after the inauguration of this treatment often all fever has disappeared, and the joint trouble may be noticed to have entirely given way. These effects have been happily described by Professor Quinlan, who states, as the result of his experience in rheumatic fever, that "by giving or withholding salicylates we can turn 'off' or 'on' the fever as we do a gas tap." In the writer's wards the students complain that they never see "rheumatic *fever*," as the symptoms and signs of the disease are, as a rule, entirely removed by the salicylic treatment before they get a sight of the patient.

Some physicians prefer to give 15 grains of the soda salt every hour for four or five doses, then every three or four hours, but each case may be treated upon its merits, and as the temperature falls the amount and frequency of the dose may be diminished. The best plan will be to proportion the size of the dose to the length of time from the commencement of the patient's illness until he came under observation. Thus, given a patient ill for several days with many joints affected, it will be well to save time by giving 30 grains of the soda salt immediately, and 10 or 15 grains every two or three hours, according to the effect upon pain and temperature. Fifteen grain doses three times a day should be given for a week after the subsidence of the pain and fever.

Salicin may be given in wafer papers containing 15 or 20 grains each, and a favorite method of administering the pure acid is to give 20 or 25 grains in half an ounce of mindererus spirit. The soda salt has a most unpleasant taste when given in ordinary mixture containing flavoring syrups or other ingredients, and by far the best plan is to

prescribe it in the form of powders, each containing 15 to 30 grains, to be given in effervescing kali or potash water. The advantages of this plan are obvious—it is more palatable, and it combines the salicylic treatment with the alkaline. These remedies should be stopped or suspended for several hours as soon as their full physiological effects, as buzzing in the ears, deafness, etc., are established.

Alkalies have been long the recognized remedies in the treatment of acute rheumatism, and it is to be feared that their value is becoming lost sight of since the introduction and general use of their more speedily acting rivals—the salicylates.

It is claimed for them that they act as specifics or antidotes to the rheumatic poison which has long been regarded as an acid substance, and though the progress of pathological research appears to point in a different direction, nevertheless experience has established the empiric fact that these agents exert a most beneficial effect upon the intensity, duration, and complications of acute rheumatism, and it is affirmed by some that they tend to prevent cardiac mischief to a marked extent.

The bicarbonate of potassium is the salt generally selected, and it should be given in doses sufficient to rapidly render the urine alkaline. Thirty grains may be given every three or four hours, and after the effect upon the renal secretion has been thoroughly established, 15 or 20 grains four or six times a day may be given for many days, or even for several weeks until the disappearance of pain and fever indicates that the disease has exhausted itself.

The addition of citric acid or fresh lemon-juice to each dose of the alkali in no way diminishes its good effects, and where a more decidedly alkaline action is desired the tartrate or acetate of potassium may also be given.

Garrod's plan of treatment consists in giving full doses of quinine (5 grains) in conjunction with alkalies every three, four or five hours. This is known as the modified alkaline treatment.

Perhaps the best of all methods of dealing with acute rheumatism is the plan followed by the writer, and probably by many others. It consists in full doses of the salicylates, as already mentioned, until a rapid impression is made upon the pyrexia and joint pains. This occurs generally within twenty-four hours, after which time the dose of salicylate is diminished by about one-half, and a moderate dose of alkali added, the combination of alkali and salicylate being kept up for many days after the disappearance of the fever and joint troubles. The bicarbonate may be given in the form of a strong aërated potash water (30 grains to 10 ounces), to which the salicylate is added just before swallowing, or 20 grains of the bicarbonate may be added to half a tumblerful of ordinary potash water, in which 20 grains of the salicylates have been dissolved, or the following mixture may be ordered:

℞.—Sodii salicylatis ℥iv.
Potassii bicarb. ℥vj.
Morphinæ hydrochlor. gr. j.
Aquæ camph. ℥xvj—M.

S.—Half a wineglassful to be taken four times a day.

Or the following plan may be adopted:

℞.—Potassi bicarb. ℥vj.
Aquæ dest. ℥xij.—M.

S.—One of the powders (*i. e.*, 20 grains salicylate of sodium) to be dissolved in two tablespoonfuls of this mixture, after which an equal quantity of lemon-juice is to be added, and the whole to be taken during effervescence, every four hours.

Lemon-juice alone in large quantities have been used by Owen Rees as a means of treating acute rheumatism through all its stages. It is doubtful if it possesses any specific virtues, but in the form of citrate of potassium its utility is established. As the free juice can do no harm, and as it affords a pleasant drink to the patient, it may be freely given, even to the extent of the juice expressed from a dozen lemons daily. This may be administered alone, diluted with water, or better still, mixed with an equal quantity of kali or potash water. In prescribing the various alkaline or salicylic compounds in the form of effervescent mixtures in rheumatic fever, it is advisable to order more lemon juice or citric acid than is merely necessary to saturate the alkali. The recipe given upon the previous page affords a method of combining the lemon-juice, alkaline, and salicylic plans of treatment. The citrate of potassium, resulting from this combination of agents, is converted into the carbonate in the system, and increases the alkalinity of the blood.

Iron, in the form of large doses of the tincture of the chloride, has been advocated by Reynolds and some others, but their results, read in the light of the natural tendency of acute rheumatism to cut itself short or to abort in many cases, do not appear to justify its use.

Antipyrine and antifebrin have been recently tried, and in some instances have given excellent results, as the reports of Guttmann show. The pain and fever rapidly yield to 15 grain doses of the former and to half the quantity of the latter drug. The effects, though more rapid, are less lasting than those obtained from salicylates, and their proper place in the treatment of acute rheumatism appears to be where salicylates fail, and it must be acknowledged this is seldom.

Where the temperature is high and, notwithstanding the free administration of natural or purified salicylates, it continues to ascend and hyperpyrexia is feared, these drugs may be given sometimes with benefit after the suspension of the salicylates.

The introduction of the purified acid will permit of very large doses being given without unpleasant results following, and hence it is highly probable that cases of acute rheumatism which fail to yield to salicy-

lates will become extremely rare, and hence the range of the newer antipyretics will be exceedingly limited in this disease.

Antifebrin seems to give better (more lasting) results than the antipyrine, and in the rheumatism of children may be tried where an analgesic effect is needed or where the profuse sweating caused by salicylates cannot be tolerated. Small doses of antifebrin (5 grains) the writer has seen to reduce temperature and relieve pain, without producing any appreciable increase in perspiration, in some cases. Latham insists upon the advantage of giving the true salicylic acid without any alkali or base. He makes a pill mass of 100 grains of the natural acid, with 15 grains acacia gum and a little mucilage. This he divides into thirty pills, and gives six every hour until buzzing of the ears occurs, then six every four hours. He attaches great importance to occasional doses of calomel.

In hyperpyrexia all these antipyretics generally are not to be relied upon.

Phenacetin has been given under similar circumstances, and though much vaunted as an analgesic and antipyretic, it remains to be proved whether it is equal in value in the treatment of acute rheumatism to the salicylates, antifebrin, or antipyrine.

Iodide of potassium in full doses (5 to 15 grains) is still recommended by some authorities. The writer has never seen any benefit from the drug in the acute form of the disease, but in the later stages it often acts more beneficially after everything else fails. It should be given with alkalies. Free iodine has been recommended by some authorities.

Trimethylamine, benzoates, guaiacum, rhus toxicodendron; propylamine, lithium salts, bromides, colchicum, sulphur, nitrate of potassium, and many other agents have been used from time to time, but their use is or should be confined to those rare cases where the previously-mentioned remedies have failed.

Opium, however, deserves some mention. At one time it was used alone as a method of treating acute rheumatism through all its stages and the writer has seen it used in 1 grain doses every four or six hours to cut short the disease and relieve pain. It certainly appears to be most useful when cardiac complications arise and when pain and cardiac distress are present. At any period of the disease opiates may be used to relieve pain and induce sleep without interfering with the action of other remedies. The combination of opium with full doses of nitre (30 grains) often gave excellent results in pre-salicylate days.

Mercury and leeching are seldom resorted to.

Blisters are recommended by Dr. Harkin in the treatment of acute rheumatism upon totally different lines from those laid down by Herbert Davies, who applied them to the affected joints. In carrying out Dr. Harkin's treatment one large blister is applied over the cardiac area as soon as the symptoms of the case warrant a positive diagnosis

of acute rheumatism being made. The writer has seen many cases of the disease treated in this way and has had the privilege of seeing the immediate effects of the treatment in several of the patients whose cases have been published by Dr. Harkin. In almost all the cases there was a most rapid and remarkable relief of all the symptoms, pain in the affected joints sometimes disappearing entirely along with swelling and local and general high temperature. In some cases no return of the symptoms occurs and an uninterrupted recovery ensues. In others the pains and fever, though lessened, continue, and salicylates with alkalies have to be resorted to.

Wet packs, hot packs, hot baths, and Turkish baths have been employed as agents in the treatment of acute rheumatism, but their use requires much discrimination. As a rule their routine administration should be discouraged, or confined to the later stages, or to sub-acute or chronic attacks. The cold pack, by frequent renewing may be used as a substitute for the cold bath in the condition of hyperpyrexia, and the hot pack, if used as a local agent, when applied to the swollen joints, is of the greatest service sometimes in relieving pain and swelling.

Local treatment is of considerable importance, and though mentioned last, it should be seen to from the beginning of the attack. The innumerable lotions, liniments, counter-irritating and anodyne applications, as a rule, should be discarded, and the plan of simply enveloping the affected joints with dry, absorbent cotton wool, held *in situ*, by loose, open-texture bandages, is by far the best. It is a great mistake to cover the wool with oiled silk or other impervious dressing, owing to the irritating nature of the cutaneous secretion. It should, for this reason, be frequently changed, and Mitchell Bruce recommends that the part should be sponged over with a warm solution of bicarbonate of sodium before applying wool. Laudanum, chloroform, belladonna, solution of salicylates, or the oil of wintergreen, or tincture of iodine have been recommended.

The most thorough and complete rest of the affected limbs is essential and sometimes a temporary splint is useful.

Davies' plan of blistering the affected joints has been already referred to. A narrow blister, encircling three-fourths of the joint, often affords most marked relief, but since the success of the salicylic or antifebrin treatment in relieving pain, it is seldom called for.

RHEUMATISM, Chronic.

The treatment of this affection appears to be in as unsatisfactory a condition as its pathology.

Totally different affections are included by many writers under the term chronic rheumatism. Confining the present remarks to those cases of joint trouble where the clinical history, symptoms, and physical signs indicate an arthritic affection, allied to acute rheumatism, the

treatment will depend upon the severity of the case and the stage at which it comes under observation.

Constitutional measures are essential in all instances, and when the attack has followed upon acute rheumatism, the remedies which afford relief in that affection may be indicated. Thus, the wearying joint pains may be often relieved by salicylates and alkalies, especially in those not uncommon cases where sub-acute attacks supervene upon very chronic joint ailments.

In treating chronic joint affections of obscure origin, sometimes one can clear up the diagnosis of rheumatism after observing the marked relief afforded by a few doses of the salicylates. Such relief to pain is, however, at the best, transitory. Attention should be paid to the general health, and any error corrected. Thus, damp and cold must be avoided; either element is bad, but when both are combined, the disease resists all treatment. Variations of temperature must be guarded against, and when the patient's means will permit of his removal to a warm and equable climate, he should be encouraged to try the change. His diet should be selected upon the principle mentioned under the head of Rheumatic Arthritis. Fats are especially indicated.

The various mineral waters as those of Bath, Wiesbaden, Baden-Baden, Buxton, Aix-les-Bains, Aix la-Chapelle, Strathpeffer, and Contrexville are indicated.

Any system of treatment which stimulates the excretory organs and facilitates the removal of waste products does good. Hence, some authorities advise the long-continued use of the salicylate of sodium, with the view of eliminating uric acid and allied products. Ziemssen gives 75 grains daily in one dose.

Bicarbonates of sodium and potassium and the lithium salts are recommended upon similar grounds. The best routine treatment for most cases is the iodide of sodium combined with alkalies, but it must be continued for a long time, and one 30 grain dose of the salicylate of sodium may be given at bed-time. This treatment gives good results in those cases, showing abundant deposits of urates in the urine. The following is a satisfactory combination:

℞.—Sodii iodidi		ʒ ij.
Sodii bicarb.		ʒ iv.
Potassii bicarb.		℥ j.
Liq. potass. arsenit.		ʒ jss.
Decocti sarsap. comp.	 ad	℥ xx.—M.

S.—A small tablespoonful in a claret-glassful of effervescing potash water three times a day, after meals.

This treatment may be alternated every month with fair doses of cod-liver oil and tincture of iron, or quinine.

Sulphur is a drug of unquestionable utility in many cases. The

compound sulphur lozenges of Garrod may be freely used, but the writer obtains the best results by combining its local use (page 756) with its internal administration. It may, moreover, be used locally, while alkalies and iodides are being employed internally. A good plan is to give one large dose, a heaped up teaspoonful, mixed up in orange marmalade along with breakfast every morning.

Ichthyol in 5 to 10 grain doses acts probably by means of its sulphur, and the onion is also valuable, if freely used as an article of food, for the same reason.

Guaiacum has long enjoyed a reputation as a remedy for chronic articular rheumatism, and is one of the chief ingredients in the electuary known as the "Chelsea Pensioner," the other constituents being nitre, sulphur, rhubarb, mustard, and treacle. In some cases it seems to relieve the joint pains.

Benzoates, salol, colchicum, or phosphorus may be tried where the alkaline remedies cannot be well tolerated.

The local treatment is of great importance in some cases, and the practice of insisting upon absolute rest for the relief of the pain in the chronic forms of articular rheumatism has been sadly abused. Many of the worst cases have become so from the prolonged rest to the affected joint, and the first step in treatment in such cases is to begin passive movement. Frastour insists upon the importance of this, even though the movement gives considerable pain. It gives better results, if adhesions have not already formed, though the writer has seen success follow where there were extensive adhesions. Passive motion is preferable in most cases to Ling's plan of resisting the voluntary efforts of the patient at flexing or extending the limb, though this is very useful in the later stages. A good plan is to begin the movements while the patient is in a hot or warm bath, and this plan is very suitable in cases where the patient finds himself able to exercise the affected joints while lying in the bath.

Massage, combined with the passive or active motion, is of the greatest use, and various local remedies may be used at the same time.

Baths of various kinds have achieved great reputation in the treatment of chronic rheumatism, and, as these are carried out at the various mineral water resorts in conjunction with the administration of the different thermal, alkaline, or sulphur waters, much good may be expected from them. Bath and Buxton give excellent results, and the Droitwich brine baths, accompanied with massage and passive movement, sometimes restores to usefulness joints which have been crippled for years. The Turkish bath may be used by those who cannot travel, and free movement of the joint, with massage of the limb, may be employed in the bath. Where the state of the patient's heart contra-indicates the Turkish bath, the Russian or hot vapor bath, or the hot pack, with local sprays, may be safely employed. After

coming out of the hot wet pack the patient should have a dry pack by being enveloped in a number of dry, hot blankets.

Sulphur baths may be useful, but the amount of sulphur contained in even the strongest thermal baths, as at Baréges, Aachen, Aix, etc., is, after all, too trifling to exert any marked therapeutic action. The temperature of the bath is an important factor in such cases.

Mud, pine, sand, and other baths are sometimes used with advantage. The mud baths of Kisch, Dax, and Marienbad are the best.

Electricity is of undoubted value in most cases if properly used. A weak continuous current passed through the affected joint is of more value than a strong current administered for a shorter period. The electrodes should be well moistened with hot salt and water. This treatment can be carried out in conjunction with any of these already mentioned, under it the wearying pains subside, thickening and exudation diminish, and the nutrition of the affected limb improves. Where there is much muscular wasting the faradic current may be used.

Of local applications, counter-irritants, anodynes, absorbents, etc., there is practically no end. The best of all topical remedies in chronic articular rheumatism has been, in the experience of the writer, the B. P. linimentum potassii iodidi cum sapone.

This should be rubbed in twice a day, the joint being at the same time exercised, and massage of the surrounding tissues accomplished, after which a light flannel bandage should be applied, over which in cold weather a piece of chamois may be habitually worn.

Sulphur appears to come next in value to this, and the writer has used these local applications every alternate two or three months. The sulphur should be rubbed dry into the skin over the affected joint and neighborhood, and covered with a thin layer of absorbent cotton-wool, kept in its place by a light bandage. There is no doubt that absorption of a small amount of the sulphur does take place, the remedy may be given internally with advantage at the same time.

Alkaline compresses, salicylates, rhus, ammonium chloride, arnica, and various other drugs have been recommended, chiefly in the form of watery solutions or local wet packs, but little benefit is to be hoped from such. Dry warmth, when possible, is better for the affected joints than any aqueous solutions.

Anodynes as chloroform, belladonna, aconite, veratrine, menthol, or other local analgesics may be tried in the form of strong spirituous or oily applications or ointments. The friction with which they are usually applied is generally the most beneficial factor.

Oleates of mercury, morphine, and cocaine may be used in the same way.

Any form of counter-irritant may be employed from the various blistering preparations of cantharides to the mild stimulating compounds containing camphor; paraffin oil and turpentine are often used. As a rule, benefit is to be expected in proportion to the amount

of friction employed. Iodine in the form of liniment is useful where the pain prevents friction and massage. It may be applied freely until an effect approaching vesication is produced.

The oils of wintergreen, cajuput, peppermint, chaulmoogra, and cloves may be employed sometimes with advantage.

Acupuncture and the actual cautery have been tried.

The clothing of the patient should be carefully seen to, and here there is a very great difficulty. The writer has satisfied himself that over-clothing is positively injurious, and in some cases would seem to be the *cause* of the joint affection. When the patient is over-clad continually, the heat-forming mechanism is, to some extent, in abeyance, and when by any chance a chilling of the surface of the body does occur the heat centres do not appear to respond sufficiently quickly. What is true in a general sense is also true in the case of local chills, and a joint or limb which is habitually swathed in woollen fabrics is much more liable to be affected by cold in the temporary absence of the usual excessive clothing. Dry woollen or flannel inner garments of *open texture*, and of the requisite lightness to ensure thorough ventilation and excape of the perspiration, and at the same time protect the surface of the body from variations in temperature meet every requirement. It is an excellent plan to have pieces of wash-leather, sewed inside the flannel under-garments, where these cover joints or prominences of bone. In this way permanent relief may be given to chronic rheumatism and rhematoid arthritis of the shoulder, elbow, knee, and acromio-clavicular joints.

RHEUMATISM, Gonorrhœal.

Drugs have little effect upon this troublesome complaint. In the acute articular form of the disease the first question to settle is the treatment of the gonorrhœa. The best plan to pursue is to cease any strong astringent or caustic injections, and to begin with a very weak solution of the permanganate of potassium in warm water (1 grain to 4 ounces). This may be injected every hour alternately with plain warm water. When pain and fever run high, the ordinary remedies for acute rheumatism may be tried in turn, beginning with salicylic acid or the soda salt, and when these fail, as they generally do, the following may be tried in their order: antipyrine, antifebrin, salol, phenacetin, exalgine, oil of wintergreen, and quinine. The last drug in large doses gives, perhaps, the most reliable results, when the above-mentioned remedies fail; alkalies (see Acute Rheumatism, page 751) should be combined with it or given alternately. Eight grains of quinine may be given dissolved in hydrobromic acid, or 6 grains of the hydrobromate of quinine may be administered every four, six, or eight hours.

The following formula may be given:

℞.—Quininæ sulph. ʒj.
Acid. hydrobrom. dil. ʒiv.
Tinct. cimicifugæ ʒvj.
Tinct. aurantii amar. ʒiv.
Aquæ dest. ad ℥vj.—M.

S.—One tablespoonful four times a day, after meals, in a little water.

In the chronic form of the disease, iodide of potassium and alkalies may be given in full doses, but their effects are at the best most uncertain. Quinine, and large doses of the tincture of iron, sometimes succeed when other remedies fail. A large mercurial purge—*i.e.*, 8 grains of calomel followed by a dose of Epsom salt—sometimes relieves pain and diminishes fever.

A mild mercurial course may be tried in very chronic cases. Absolute rest and all the precautions necessary in acute rheumatism must be resorted to in severe cases.

Local treatment will consist in the use of anodynes or counter-irritants, according to the acuteness of the pain. Hot fomentations or warm poultices smeared over with the extract of belladonna may be tried. The various anodyne applications mentioned under Chronic Rheumatism, page 756, may be used. The best of these is a liniment composed of equal parts of chloroform and belladonna liniment and aconite tincture. Splints may be necessary to secure complete immobility of the limb.

As a rule, a fly blister made to encircle the affected joint will give more relief than any other application, and in very chronic cases this may be applied often. Passive or active movements, massage, friction, and the various remedies recommended on page 756 may be resorted to. Electricity sometimes does great good,

Hot baths are to be tried, and the writer has seen good results from the spirit lamp bath, and fumigation of the limb with the vapour of of calomel, or strapping it over Scott's dressing.

RHEUMATISM, Muscular.

At the very early stages a few large doses of salicylate of sodium may cut short the disease with rapidity. A very hot bath (106° F.) or the Turkish or Russian bath may be given, but, as a rule, dry heat is best. Where a hot-water bath only is available, it should be followed by a dry hot pack for an hour or more. This often suffices to relieve lumbago and torticollis. Where the pain is not speedily relieved by these measures, a hypodermic injection of ½ grain of morphine should be given. The various anodyne applications already mentioned may be tried, and chloroform and belladonna liniments in equal amounts may be applied upon lint and covered with oiled silk, over which a large pad of cotton wool is to be kept in place by a flannel roller. Hot fomentations, poultices, and dry cupping may

be tried, and a smart saline purge, followed by the alkaline treatment described under Acute Rheumatism, generally succeeds in giving relief.

The continuous current not infrequently fails, but sometimes it acts like a charm. Puncture of the affected muscles by a large needle driven deeply into the tissues often gives speedy relief.

In chronic cases the remedies mentioned under Chronic Rheumatism must be resorted to, the iodide of potassium three times a day, with one large dose of salicylate of sodium at night, being the best routine treatment when given in combination with the Turkish bath, dry or wet hot packing.

RICKETS.

Each authority in speaking of the treatment of rickets emphasizes the necessity for correcting some particular error by which, in his opinion, the disease has originated.

As we cannot be said to have sufficient evidence to prove upon what error of diet or environment this condition depends, it is the duty of the physician to minutely investigate every detail of feeding and everything connected with the sanitary surroundings of the child, and to have any violation of the laws of health promptly rectified.

Some debilitating influence operating upon the mother during pregnancy, or during the period of lactation, may be the cause of the malnutrition in the infant, and this consideration shows the very obvious importance of preventive treatment.

A very poor lacteal secretion may be the cause of rickets, and when such is evident the child should be weaned or have a healthy wet nurse. Much more frequently, however, it would appear that a too rigid adherence to some one particular artificial food may be the cause, and a change in this direction may be imperatively necessary. The physician must bear in mind the sometimes marked peculiarities which exist in young children, and any hard and fast lines for feeding must be considerably relaxed. One infant will thrive upon the milk of a cow which will be poison to another and apparently a stronger child. Patience and discrimination in this matter are, therefore, of the greatest importance at the very outset.

As a rule, it may be safely laid down that the most easily digestible food will give the best results, and there are good grounds for believing that an abundance of animal fat is necessary in this form of malnutrition.

With older children, and indeed in most cases of rickets, even in infants, cream may be freely given. Butter and yolk of egg are also valuable. The writer has frequently satisfied himself of the good results of beef-juice, raw meat, and soups. The more varied the food the better, provided it can be digested. A good mutton broth, with the excess of fat removed and all the vegetables carefully strained out

by passing it through a fine sieve, is the best compound for the children of the poor. Much has been written against farinaceous or starchy foods which is probably incorrect; nevertheless, they should be used sparingly. Exclusive feeding upon these substances must be condemned, and the younger the child the more serious does such a mistake become.

The food upon which the cow is being fed which supplies the milk is of vital importance, and it is the point which is generally overlooked. The practice of feeding cows upon the distillery refuse so freely used for this purpose in large cities is a serious matter, especially when we find that this form of food is often in a stage of incipient putrefaction, and it is sometimes unscrupulously used to the exclusion of sound fodder in order to increase the yield of milk.

Plenty of sunshine and pure air are essential to the patient, as they are necessary also to the nursing mother or to the animal supplying the milk for consumption by the rickety child. Cold and damp are to be avoided.

Cheadle maintains that the food of a child suffering from rickets should contain an amount of animal fat equal to at least one-fourth of the total solids, proteids about one-third, the carbohydrates a little over one-third, and the salts about one-tenth, and that such a diet will cure rickets without medicine.

Muskett, who has recently drawn the attention of the profession to the appearance of rickets in Australia, finds the same causes at work as in the old centres of civilization. He lays great stress upon the necessity of a raw-meat diet, with cream. He advises a child ten months old to get 2 ounces raw meat pulp daily, fresh boiled milk diluted with barley water, and entire wheat flour, as recommended by Cheadle.

In some cases peptonizing the milk or food will be found useful. Vegetables are essential for older children, but unripe fruits are very injurious.

Warm clothing and occasional bathing must be insisted upon. A warm salt-water bath, in which sea-weed has been infused, may be used with advantage in the absence of acute symptoms. It is necessary to see that the child be not permitted to kick or push off his bed-clothes at night.

The question of the amount of exercise to be permitted is a difficult one, and the physician must be guided by the amount of bone deformity. Perhaps it is correct to state that mistakes are too often made by compelling children to remain in the horizontal position for long periods, to the detriment of their general health. The influence of the weight of the body in increasing the deformity may be easily exaggerated. It may be wiser to enforce rest more rigidly in the case of female children, with the view of guarding against pelvic narrowing.

The vast majority of cases of rickets recover without leaving any appreciable deformity, and this fact should be borne in mind in the

management of mild cases. Well-padded, soft splints may be used where there is much bending of the legs.

Many drugs have been recommended in rickets about the utility of which very adverse opinions are held. There is one, however, about which all observers are agreed. Cod liver oil is undoubtedly of the greatest value and may be given freely, provided it does not interfere with appetite and digestion. In bad cases, associated with much wasting, the oil should be used externally as well, and too much cannot be said for the method of using the abdominal roller with friction and cod-liver oil, as already described upon page 507.

Tonics (iron especially) are useful in most cases, and the syrupus ferri phosphatis compositus (Parrish) is the most popular of all these drugs. Various other syrups containing calcium are largely prescribed, but it is held by many to be exceedingly doubtful that lime is of any use in this disease. The large doses of the lactophosphate often recommended must be sometimes injurious. Large quantities of lime salts are thrown out of the body in rickets, but it is hardly possible that the phosphate administered can take their place in the system. Though it does not act as a restorative, it may exert some influence on nutrition by its action upon the nerve-centres.

Phosphates of iron and calcium and phosphoric acid are often given upon the supposition that they supply phosphorus to the affected bones. This is, of course, a mistake. These bodies remain as phosphates in the blood, and do not exert any of the marked effects of phosphorus when given in the free form.

Free phosphorus has of late years been much used in the treatment of rickets, and there cannot be any question of its marked effects upon the growth of the bone.

Wegner demonstrated that small quantities of free phosphorus stimulated and altered the growth of bone when given to healthy animals, so that the cancellated structure became hard, compact bone; and in the case of fowls the shafts of the long bones became solid cylinders of dense osseous tissue. Kassowitz found that when given in rickets, even of the most advanced type, speedy recovery always resulted, the bones becoming hard in four week in most cases.

Numerous observers, among whom are Hartwitz, Jacobi, Friese, and Montmolli have confirmed these very striking results. He advises that the drug should be given dissolved in cod-liver oil (1 : 10,000). Hazard's solution as devised by Thompson consists of the following:

℞.—Phosphorus	1 grain (or 0.0648 grammes.)
Absolute alcohol . . .	350 minims (20.65 c. c.)
Glycerin	2 ounces (56.79 c. c.)
Spt. of peppermint . . .	10 minims (.59 c. c.)

Five minims of this solution may be given to a child three years old. Double this dose in the opinion of Berg should not be given, and the

danger of inducing degeneration of the liver-cells must not be forgotten.

Dembitz uses the following solution in half-drachm doses twice daily. It may be given in conjunction with cod-liver oil after meals.

℞.—Phosphori gr. ¼.
Carbon. bisulph. gtt. vj.
Aquæ dest. ℥iv.—M.

The B. C. P. formula is a valuable one: Phosphorus 1½ grains, chloroform 2½ drachms, ethylic alcohol, 12½ drachms. Dose for a child three years old—1 minim. The writer, however, prefers the following simple formula to all others:

℞.—Olei phosphorati (U. S. P.) ♏xl.
Olei morrhuæ ad ℥vj—M.

S.—One teaspoonful for a child one year old, to be given after food, along with an equal quantity of fresh cream.

The writer's experience of the phosphorus treatment of rickets is too limited to make an expression of opinion from him of any value, but while he has no doubt of its great efficacy in cutting short the disease, he thinks it may possibly be found to be open to serious objection. Considering the experimental results of Wegner, who has demonstrated the condensation and hardening produced in bone by its use, and remembering that the great majority of cases of rickets recover upon improved diet and cod-liver oil, without leaving any permanent deformity, it does not seem possible that phosphorus might determine the setting of the bones permanently in their deformed condition. This conclusion is, however, based upon theoretical considerations, and it is not arrived at by clinical experience, but its importance, if it be found to be correct, can hardly be exaggerated.

The local treatment, after the subsidence of acute symptoms, will consist in the cautious use of massage and galvanism. Intestinal and pulmonary catarrhs should receive early and prompt attention when they arise. The treatment of the permanent deformities is to be carried out upon general surgical principles by osteotomy, osteoclasis, or excision, or by suitable mechanical appliances.

RIGOR.

Though no treatment will be of any use unless it succeed in combating the cause of the rigor, nevertheless the condition of the patient can be made much more endurable by a few simple measures.

Following up the natural instinct of the patient, who generally has a marked desire to get as near to the fire or any convenient source of heat as possible, the physician should insist that he take immediately to his bed, where he may be surrounded by dry warm blankets, hot

water bottles, and excess of clothing. Stimulants may be freely given. One full dose of brandy or whiskey should be administered as soon as possible. It is advisable to give this with some very hot water and a little sugar. When the heat has been brought to the surface of the body the excessive clothing may be gradually removed.

Of drugs, nitrite of amyl and chloroform sometimes markedly cut short the attack; but, upon the whole, it is advisable to maintain a position of neutrality, and await further symptoms. Quinine often prevents or modifies the severity of recurring attacks; but, owing to its slowness of action, it has no effect whatever upon the rigor if administered during its presence. It is of most value in the rigors of pyæmia. The newer antipyretics do not give any more satisfactory results. The old-fashioned plan of giving a speedy emetic at the very outset, when this is feasible, sometimes appears to modify the severity and duration of the rigors which usher in acute inflammatory or zymotic affections. When there is much constitutional excitement or apprehension on the part of the patient, a hypodermic injection of morphine often is of great benefit. It should, however, be used with caution if renal disease is marked. In the rigors following the use of the catheter, if given immediately upon the first feeling of chilliness, the rigor may be prevented.

RINGWORM—See Tinea.

RODENT ULCER.

The treatment of this obstinate affection should be that indicated for epithelioma. Constitutional remedies are worthless, and removal of the ulcer affords the only means of checking or curing the disease. Where circumstances permit, complete excision by the knife is, upon the whole, the most satisfactory. Sometimes, however, the situation of the ulcer renders a cutting operation difficult and incomplete, and sometimes the patient will submit to the destruction of the growth by means of caustics, when the use of the knife will not be permitted. A third method, which gives the best results in large ulcers, is available by combining the knife and caustics, and by this combined plan of operation extensive and deep ulcers may be permanently destroyed, which otherwise would be beyond the reach of surgery.

In the use of the knife it is necessary to go wide of the ulcer, leaving a perfectly healthy floor and margins.

Where caustics are to be used, the operator has the choice of chloride of zinc, Vienna paste, potassa fusa, London paste, arsenic, nitric acid, the acid nitrate of mercury, etc.

The most satisfactory of these is the first mentioned. By attention to details the limits and depth of its destructive action may be counted upon with comparative certainty. The writer has used it many times in the treatment of this affection occuring in the practice of the late Professor Gordon, and always without any mishap, even when the

ulcer had crept into the orbit. The chloride may be mixed with three parts of wheaten flour, and in this condition it may be spread dry in an even layer upon the ulcer. If the surface to be destroyed is not a freely secreting one, the powder may be made into a stiff paste with water, and spread in a layer as thick as a half-sovereign. The surrounding tissues may be preserved by means of plaster-of-Paris, but this is seldom necessary. The paste may be left *in situ*, but about the face it is better to remove it in two or three hours, and re-apply it again as soon as the slough has separated. In this way the depth of its destructive action can be regulated almost with the precision obtainable by the use of the knife.

In the destruction or extirpation of deep and wide ulcers by the knife, if the hollow bones of the face or orbital cavity have been invaded, the combined method is the only one available, the zinc paste being carefully applied to the recesses of the knife wound. In some cases the actual cautery, the thermo- or galvano-cautery, may be used. Occasionally in the early stages of rodent ulcer the milder treatment applicable to lupus may be successful. The after-treatment of the ulcer is to be conducted upon general principles.

ROSEOLA.

The treatment of this mild affection may be carried out upon the lines indicated under Erythema, page 259. A mild diaphoretic following a saline purgative, and the use of a warm bath containing a little alkaline carbonate, and in severe cases the anointing of the skin by a bland oil or by lard is all that is generally necessary.

ROTHELN.

The treatment applicable to a very mild attack of measles may be carried out in most cases of German measles. (See page 489.) The patient will require little medication, save the diuretic mixture mentioned upon 490.

ROUND WORMS—See Ascaris Lumbricoides, page 53.

RUBEOLA—See Measles, page 489.

RUPIA.

The treatment of this affection will simply resolve itself into the treatment of the disease of which it is one of the varied manifestations —syphilis. There are only two drugs of any known value, and these are mercury and iodides. Rupial eruptions, according to Hutchinson, usually occur after mercury has been given (in the treatment of syphilis) in too large doses, and has disagreed and been wholly laid aside for some time. Donovan's solution, internally, may be given, and though sometimes in these cases the iodide of potassium or sodium

may give excellent results, as a rule, mercury will be necessary. When this drug is given in rupia the dose should be small, and the administration must be continued for a long period, but the constitutional effects of the drug are to be avoided. Sometimes it will be found advisable to suspend the mercury for a few weeks, during which large doses of the iodide may be tried. Recently the writer saw a most intractable case of rupial ulceration which had resisted all treatment in the wards of Professor Fournier until he tried the hypodermic injection of dog's serum, as recommended by Professor Richet; most marked improvement rapidly set in. The general health of the patient is a matter of vital importance, and the diet must be of the best possible. Change of scene, and, if feasible, an ocean voyage may be desirable.

Locally, little need be done in most cases, as the crusts fall off after the ulceration heals under the influence of the mercurial iodide course, and it not advisable to disturb the crusts or interfere with them in any way.

Where ulcerated surfaces are found, in spite of this treatment, an ointment of iodoform will be the best dressing. The fumigation bath with the vapor of sublimed calomel sometimes acts like a charm.

RUPTURE—See Hernia

SACRO-ILIAC JOINT DISEASE.

The treatment will be based upon the general principles laid down for knee-joint and hip-joint affection upon pages 429 and 364. Thus, absolute rest to the affected surfaces must be rigidly maintained for a long period. Abscesses should be opened as soon as their presence is demonstrated, and after these fail to heal, all sinuses may be opened up and any diseased bone removed. The constitutional remedies and general directions as to diet, environment, etc., apply to this affection.

SARCINÆ.

The treatment of these microscopic fungi simply resolves itself into the management of the primary gastric affection, which is fully dealt with under the headings of dyspepsia and cancer of the stomach.

SCABIES.

The use of almost any one of the innumerable parasiticides will kill the acarus and its ova, but the most harmless to the patient, and the one most certain and cleanly in its action, is sulphur when properly used. The speediest cure is Vleminckx's solution, by means of which a smart attack of itch may sometimes be removed in a few hours. This solution is prepared by boiling lime or lime putty with sulphur in a large quantity of water, and after the sediment subsides a brilliant, clear yellow solution remains, which is the remedy under consideration.

The proportions of the ingredients are of little matter as it is well to have them in excess, and the water will only dissolve a small amount of the penta-sulphide of calcium. Two ounces of sublimed sulphur, and 1 ounce of slaked lime will make a gallon of the fluid, and with this a large school of children affected with scabies may be cured in a few hours. All that is necessary is to take a small sponge and swab the solution freely into the skin. As the liquid comes into contact with the organic matter contained in the secretions of the skin it gives off free sulphuretted hydrogen, and leaves a fine powdery residue, filling up the furrows on the cutaneous surface. A previous hot bath, with soft soap scrubbing is not necessary, and hence sometimes little irritation is caused by the remedy, but when there is already much traumatic eczema present, and where the liquid is rubbed in or applied frequently, it may produce considerable irritation.

Immediately after its use the patient may put on his clothes, when the excess of the liquid will cause destruction to any wandering male or young female insects adhering to them.

It is well to make several applications to insure complete destruction to any young which may have escaped the action of the liquid, owing to their deep position in the burrows.

Powdered or sublimed sulphur may also be applied in its dry state, and well rubbed into the skin and sprinkled over the inner surface of the flannel or woven under-garments. It can be rubbed into the hands and between the fingers, after which a leather glove may be worn. This method, which is cleanly is not at all so efficacious as the solution.

The oldest, and, perhaps, the surest of all methods of using sulphur for the treatment of scabies is to give the patient a good hot bath, in which the body is to be thoroughly scrubbed with a hair brush and soft soap, so as to open up the burrows of the itch insect, after which sulphur ointment (1 : 5) is to be rubbed in for several minutes with the palms of the hands into every part of the cutaneous surface, except the face and scalp.

This can be best done before going to bed, the patient sleeping in a combination dress. In the army, after the bath, scrubbing, and rubbing in the ointment, a blanket, smeared over with the ointment, used to be wrapped around the patient's body.

The U. S. P. ointment is quite too strong, and will give rise to severe irritation if applied for several nights in succession. After the usual bath and scrubbing, a weaker preparation (1 : 12) will answer all purposes if the applications are kept up, but it is well to begin with the official ointment. The writer has not used the ointment for the last fifteen years, and has never seen a case which did not yield to the solution after a few applications. It is a good thing to give the clothes a short baking in an even or disinfecting chamber. It is said to kill the ova, but these probably never get upon the clothing.

The innumerable formulæ, containing Peruvian balsam, storax, tar,

paraffin oil, copaiba, stavesacre, green soap, cocculus indicus, creasote, phosphorus, oils of cade, cajuput, anise, etc., should be banished from our text-books.

After the destruction of the insect it may be necessary to treat the eczema and irritation, partly the result of the parasite, and partly the result of the remedy; some bland unirritating ointment, lard, or oil, easily accomplishes this.

SCALDS—See under Burns, page 95.

SCARLATINA.

Under the head of Measles, upon page 489, the diet, selection of a sick room, and other details of importance are mentioned, which are equally applicable to scarlatina, and need not be here mentioned. Owing to the highly infectious nature of this disease the sick-room should be as isolated as possible, and a sheet dipped in carbolic lotion (1 : 100) should be fastened outside the door with the view of cutting the room off completely from the rest of the house. This will also keep the air of the sick chamber quite sweet. Relief may be obtained by sponging over the body with a soft sponge and warm water, only a small portion of the surface being exposed at one time.

It is not advisable to permit baths at this stage, especially when the rash is ill-developed. At a later period their use is indispensable. The bowels should be relieved with a smart saline as early as the case comes under observation.

Numerous drugs and systems of treatment are still recommended with the view of cutting short the fever and destroying the microbe upon whose presence the disease is believed to depend.

The writer cannot say that he has found any such specific action in any of these agents. Some of them are positively dangerous if given in full doses, and, as a broad rule, it is still to some extent true, that "scarlatina is dangerous only through the officiousness of the physician."

The writer was tempted once to say that it might be accepted as a general truth, to which there were not many exceptions, that a *mild* case of scarlatina needed no medical treatment, while the really *malignant* cases were generally beyond the reach of any treatment.

Nevertheless, in the management of this disease, its complications and sequelæ, there is often wide scope for the skilled therapeutist.

The treatment may be divided into two distinct parts—viz., the guiding of the patient through his attack, and the means by which the disease may be prevented from spreading to other members of the same household. In cases evidently mild from the beginning, the preventive treatment is obviously the most important, and this is more true of scarlatina than of most other contagious diseases, for the simple reason that the mortality falls greatly with the age, and if a child can

be shielded from infection as long as possible, his attack will probably be milder when the inevitable does overtake him in after years.

The importance of isolation and scrupulous nursing are obvious, and it must be pointed out that the popular notion is wrong—that the most infectious period is during the later stages of desquamation. The disease is undoubtedly *very* infectious in the early stages when the rash and fever are at their height.

The most valuable preventive of the spread of the disease germs is the anointing of the body with a weak carbolic oil (1 : 50). This may be commenced from the first, and if such an application fails to destroy the germs, it will effectually prevent the spread of the fine epithelial dust containing them; an oil (1 : 25), may be freely used afterward when desquamation sets in. The free use of stronger solutions may possibly endanger the kidneys. Hot baths and scrubbing of the skin to remove the dead epithelium, should be resorted to, after the subsidence of the fever and throat complications. Oil of eucalyptus may be used instead of the carbolic oil, and corrosive sublimate (1 : 4000) has been highly recommended. Its occasional use would be unobjectionable.

In the early stages a mild diaphoretic can do no harm, and for a child two or three years old a mixture may be ordered like the following:

℞.—Spt. æther. nit. ℥ij.
Liq. ammon. acet. ℥jss.
Potassii citratis ℥j.
Syr. simplicis ℥j.
Aquæ camph. ad ℥iv.—M.

S.—A teaspoonful to be taken every third hour.

In the wards of the Belfast Royal Hospital where this *expectant* method is applied in a routine way, I find that for the ten years ending in 1883, only one death occurred, and this patient was moribund upon admission, but it would be manifestly unfair to attach too much importance to these results as only 133 cases were admitted during this period. The diet was almost exclusively milk; nephritis was rare.

When the fever runs very high, small doses of antipyrine may be given, and in adynamic cases, quinine. When hyperpyrexia occurs, tepid baths and cold affusion may be tried. The salicylate of sodium often acts well as an antipyretic.

The drugs recommended for the *routine* treatment of scarlatina are very numerous, and statistics are quoted to prove extraordinary value of most of them.

Biniodide of mercury, originally advocated by Dr. Illingworth, and maintained by many physicians to be a specific, has been extensively employed, and upon the whole, the various reports are favorable. The writer's experience is too limited, but he has not any intention of trying

it again as a routine remedy; $\frac{1}{32}$ grain of the bichloride of mercury may be given in a tablespoonful of sweetened water along with 2 grains of the iodide of potassium every two or three hours. It is claimed by many that this treatment rapidly diminishes fever and prevents desquamation, and limits the period for isolation to between two and three weeks in all.

The bichloride of mercury has been used alone with similar glowing results, and gray powder has also been tried.

Salicylic acid and the soda salt have been extensively used as routine remedies.

Mineral acids, notably the hydrochloric, are harmless agents, and appear to be as grateful and beneficial as they are in typhoid and typhus fevers, where their routine employment is generally spoken of as the Swedish method of treating fevers.

Oxygen and peroxide of hydrogen—the former as water charged with the gas, the latter as the solution prepared by acting upon peroxide of barium by hydrochloric acid—are safe and, according to the testimony of many competent observers, valuable remedies in adynamic cases.

Ammonia carbonate in small doses frequently administered has been supposed to possess specific action, but there is little to be said in support of the drug except in adynamic cases, and then only for a limited period is it admissible.

Oil of eucalyptus, upon the glowing reports of Curgeuven, is attracting some attention. He gives internally a few drops in water, and sprinkles to saturation everything about the patient with it. Extraordinary success is claimed for the specific action of the remedy. The writer has long used it as an anointing oil alone or mixed with the carbolic oil, and believes that it is a safe and efficient destroyer of the virus as it comes off by the skin, and much more reliable than weak carbolic oil.

Chlorate of potassium is a favorite drug for routine administration, especially in cases where the symptoms are very prominent, when it is often given in full doses, as well as being at the same time employed locally. It should be given with caution, as it has caused or exaggerated nephritic complications, and in large doses it is dangerous. Upon the whole, its use should be limited to gargles and sprays in this disease where nephritis is a possible or likely sequela. The writer has seen it do serious mischief.

Benzoates of sodium and ammonia have been recommended and used, but with somewhat doubtful success.

Sulphocarbolate of sodium has been much used in the treatment of scarlatina, and though the writer does not think it necessary to employ it as a routine method of treatment, nevertheless he resorts to it in cases of severity of fever or throat symptoms. A child four years old may get 2 or 3 grains every three hours. It is valuable in the later stages where suppuration of the throat has occurred.

Quinine in some severe cases appears to do well, and if combined with iron it meets the requirements of reducing temperature and modifying the unhealthy action in the throat. Digitalis is used by some authorities as the best antipyretic in conjunction with quinine.

Locally the best routine treatment for the majority of cases is a weak carbolic solution *sprayed* into the throat. The following formula may be used with the youngest children:

℞.—Glycerini		℥j.
Pulv. sodii bor.		ʒj.
Acidi carbolici		gr. xlv.
Aquæ rosæ	 ad	℥x.—M.

Older children may use this as a gargle, diluted with half as much water. The glycerin of carbolic acid (1 : 5) may be cautiously applied on lint to the tonsils if any membranous exudation appears.

Gargles containing chlorine, bromine, iodine, corrosive sublimate, iodide of mercury, sulphurous acid, permanganate of potassium, sulphur, tincture of iron, boroglyceride, chlorate of potassium, and any other antiseptic may be used. These may also be employed as sprays.

Iced compresses, warm poultices, cotton wool under oiled silk, or local wet packs, cold or hot according to the relief which they afford, may be tried; and where there is great swelling of the tonsils, steaming by holding the head over boiling water under a sheet or tent made in the bed may give ease.

Various opinions are held about the treatment of severe cases where the rash fails to come out. The hot pack must be used with great caution, especially if the temperature is high in such cases, but the administration of a hot bath containing a little mustard may be tried, for a few minutes only, with advantage. With a badly developed rash and a very high temperature the cold bath, cold affusion, or the cold pack may be cautiously employed.

Pilocarpine hypodermically, aconite, veratrum, and other drugs internally, seldom give good results under such circumstances, and their use is fraught with danger. Rheumatism, nephritis, and other complications are treated upon the lines mentioned under their several headings.

Six weeks is considered a fair average period of isolation, but complications and tardy desquamation may prolong it to nine. This period may be materially shortened by the use of soap, warm baths, and scrubbing, and there is little doubt but the free use of the oil of eucalyptus may in many cases safely reduce it to one month.

SCIATICA.

Under the heading of Neuralgia (pages 521 to 536), all the various remedies found useful in sciatica have been fully discussed. They may be briefly summed up here for convenience. First, and by far the

most successful in the majority of recent cases, is the author's method of using morphine by the hypodermic syringe. This may be regarded as a combination of acupuncture, aquapuncture, parenchymatous injection and narcotics (page 523); absolute rest, counter-irritation by blisters, liniments, actual or thermo-cautery; drugs, such as salicylates, salol, quinine, large doses of iodide of potassium, chloride of ammonium, phenacetin, antipyrine, exalgine, cannabis indica, atropine, arsenic, iron, phosphorus, cod-liver oil, phosphide of zinc, cimicifuga, gelsemium, ergot, nitrate of silver, stramonium, turpentine, benzoate of sodium, the relative values of which are referred to under Neuralgia.

Local anodynes, as chloroform, belladonna liniments, veratrine, menthol, conium, atropine, methyl chloride and ether sprays, are, as a rule, disappointing; so are injections of cocaine, antipyrine, theine, ether etc. Electricity and galvanism have been already discussed. They are sometimes of the greatest value, alone or combined with hydropathy, Turkish baths, and massage. In chronic cases the great value of deep injections of a 1 per cent. solution of osmic acid, combined with frequent punctures, has been already referred to.

Some cases yield to the local application of sublimed sulphur, cotton wool, and bandaging. Where these measures fail the operations of nerve-stretching, neurotomy, and neurectomy, as described upon page 534, may be resorted to. Suspension, as employed in locomotor ataxia, may have a trial, and hypnotism has been successfully pressed into the service.

SCLERODERMA.

The treatment of this condition is in the same highly unsatisfactory state as is its pathology. In the absence of any definite knowledge, the physician will be safe in paying attention to the general state of the patient, and in correcting any abnormal condition or violation of the laws of health.

Tonics, such as arsenic, phosphorus, chloride of gold, nitrate and oxide of silver, cod-liver oil, and iron, have occasionally been found of use when combined with warm flannel clothing, and abundance of pure air and good food. Mercurials are harmful.

Massage, electricity, Turkish baths, and persistent inunction of the body by any animal oil or fat, if carried out with the internal administration of one or more of the above tonics, will give the best results to be expected in our present state of knowledge.

Sclerema neonatorum has been successfully treated by small doses of mild mercurials; but the chief hope in such cases will lie in enveloping the body in successive layers of cotton wool, and keeping it in a very warm or hot room, and artificial feeding by a soft rubber catheter with peptonized foods and meat juice.

SCLEROSIS, Disseminated.

Little can be accomplished in the treatment of this disease. One drug after another has from time to time enjoyed some ephemeral reputation as a specific; but, nevertheless, owing to the numerous complications which may arise during its progress, the physician may, by the aid of drugs and by the help of therapeutic measures, be able to prolong life and diminish pain and discomfort.

Iodide of potassium appears in many cases to have the power of at least arresting the development of the disease, and it or the iodide of sodium should get the first trial in all cases coming under treatment; but the drug must be given for a long time, and in full doses; 10 to 15 grains three times a day have appeared to the writer to check the progress of the degeneration for a time.

The next drug from which there is some prospect of benefit is the chloride of gold and sodium, and Batholow affirmed that it sometimes cures He stated that it had the power of causing absorption of connective tissues of pathological formation. The dose should be $\frac{1}{12}$ grain in pill twice or three times daily.

Nitrate of silver appears to act in the same way, but its power of causing discoloration of the skin must be remembered.

Next in order of reputation comes mercury, and some believe that the bichloride in small doses, if given early, will arrest the disease. It should always be given if there be any reason to suspect the presence of a syphilitic taint, and it may be given without any hesitation combined with the iodide of potassium, omitting it each alternate month, while the iodide is continued.

Arsenic, phosphorus, zinc, and the host of so-called tonics have been recommended, and cod-liver oil should always be tried in early cases.

Massage and sulphur baths have been found useful by Bastian in the earlier stages.

Galvanism and electricity are sometimes harmful, though occasionally they may appear to give temporary benefit.

Bedsores, bladder troubles, insomia, and other complications are to be treated upon general principles, and no means by which the general nutrition of the body can be improved is to be neglected.

SCLEROTITIS.

As inflammation of the sclerotic is generally secondary to choroiditis or iritis, the details of treatment mentioned under these headings should be carried out.

In episcleritis, anodynes, as atropine, instilled into the eye, with a paste composed of glycerin and extract of belladonna smeared over the brow, and a smart saline purge, followed by full doses of the salicylate of sodium, will give relief in most cases.

SCROFULA.

The treatment of scrofula need not be here entered upon at any length. Under the head of Phthisis full particulars are detailed regarding improved hygiene, ventilation, clothing, food, occupation, residence, drugs, etc. Without here discussing the identity of scrofula and tuberculosis, all that is written concerning phthisis may be safely applied to scrofula or struma, and hence there is no necessity for repetition. Under the headings of Joint Diseases, Caries, Ophthalmia, Lupus, etc., the various treatments of the local manifestations of this diathesis are enumerated. It remains to mention the treatment of the strumous affection of the lymphatic glands, though even this is scarcely necessary, since the remedial measures detailed under the heading of Lymphadenitis, upon page 479, embrace nearly everything applicable to strumous adenitis.

Where suppuration has already occurred in the glands, there can be little doubt that its evacuation is the only practical solution, and this should be carried out in the ways already mentioned, the free incision being generally the most satisfactory. A word may be said about the most suitable time for incising, and the generally accepted rule is to make an opening as soon as fluctuation demonstrates the presence of pus. The writer ventures to question the wisdom of such a rule when applied to the evacuation of pus from a chronically-inflamed strumous gland.

There is no objection to wait for some time until the matter comes nearer to the surface if deep in glands—about the jaw, for example. The more complete the suppuration the less likelihood of a return, and the less chance of the wound closing up too soon, and hence the advantage of a reasonable delay, but, of course, delay until the skin itself participates is to be condemned. It is, moreover, not advisable to have the contents of a disorganized gland trickling over a fresh incised surface of any magnitude when this can be diminished by judicious waiting.

About the face as small a wound as possible should be made, and it is a matter of great importance to insure that the incision into the capsule of the gland is fully as large as, or larger than, the skin opening. When very small, a minute drainage-tube or a few strands of carbolized tow may be inserted for a time, though this generally gives very slow results.

The greatest difficulty is experienced in the indolent glands which do not suppurate. Where constitutional measures, as improved dietary, fresh air, prolonged courses of iodine, iodide of iron, cod-liver oil, phosphates, arsenic, etc., fail, local measures may be pushed. These are mentioned already upon page 478. Counter-irritation by iodine applications, as the tincture of the U. S. P., may be persevered with. Friction, with the ointment of iodide of lead, or of iodine, or the lin. potass. iod. cum sapone (B. P.), gives good results. Where

the gland occupies a prominent position, suppuration may be encouraged by the injection of irritants, as the tincture of iodine, carbolic acid, etc., but this can generally be accomplished by rough friction with iodine ointments. Sometimes these injections cause rapid resolution without suppuration. The method of Treves (page 480) may be tried, and, where all measures fail, the speedy, safe, and generally satisfactory method is to excise the gland or glands by the knife. Where a portion of a gland only has broken down and suppurated, the writer has obtained good results by inserting a small spoon through the original opening and scraping out the cavity.

Duncan thus sums up his advice about the treatment of strumous glands:

"First, the glands being in the early stage, you apply all those internal hygienic remedies which the physicians will point out to you. You apply *rest* by means of a well-padded stock and cuirass. Supposing it was further advanced, but not suppurated, then I would use the injection of iodine, two, three, or four drops injected into each gland, according to circumstances. I think the iodine is better than the bichloride. I tried ignipuncture by putting in the platinum wire through the gland, and threading upon it hollow needles, taking care not to heat the hollow needles and hurt the skin. You can then destroy large portions by electric heat without making a skin wound. I must say that ignipuncture has not been so satisfactory as I should have expected, although I have seen cases in which considerable improvement followed, whether because I at the same time put the glands at absolute rest or not, I am not quite sure. Suppose the iodine injection fail, then opening and scraping, I should add to the scraping the injection of parasiticides. I myself use salicylic or boric acid for the purpose of destroying the bacilli, whether pyogenic or tubercular. And, lastly, in a few and limited number of cases, excision of the glands."

Treves strongly condemns the use of iodine externally. He says it is probably in nearly all cases harmful, and he urges the necessity of securing absolute rest to the head and neck. He states that scraping and cautery puncture are only available for a very limited number of cases, and he insists that excision offers the simplest, safest, and most certain method of treating this obstinate affection, and expresses his opinion: "For no measure which has been employed for the treatment of the strumous neck can such excellent results be claimed as attend upon the simple excision of the glands. Considering the grave complications attending the disease, the tedious path it follows, and the disfigurement it leaves, it may be permitted to regard this operation as not the least of the improvements in modern surgery."

SCURVY.

The remedies for this affection are free supplies of vegetables, both as preventive and curative agents. The disease has almost disappeared from observation since the compulsory regulation insisting upon ship owners to supply lemon-juice to their sailors. Fresh lemon-juice is at once the best prophylactic and the best remedy once the disease has become established. It may in this latter case be used freely in the presence of diarrhœa and dysentery. Indeed, as a general rule, it is useless to attempt the cure of any of the complications of scurvy as long as the blood condition remains unremedied. Therefore, as soon as the patient is put to bed, no matter what his condition may be, *fresh* lemon-juice diluted with water should be administered every hour or two. Lime-juice, and even citric acid, where nothing better can be had, may be given. Fresh vegetables of every kind may be given—lettuces, salad, fruit, cabbage, mashed potatoes, etc.

As soon as the condition of the gums permits, solid animal food may be used, and underdone roast meat or steak is the best. Strong soups, beef juices and essences, or broths containing large quantities of fresh vegetable matters strained out just before administration, may be given when the state of the mouth prevents mastication.

Ulcers may be treated with a lotion of lemon-juice. The bleeding gums may be improved by vegetable astringents used as mouth washes. The following is suitable :

℞.—Tinct. krameriæ ℥j.
Tinct. catechu comp. ℥ss.
Decoct. quercus ad ℥xx.—M.

Where there is much fetor of the breath, weak chlorine or iodine solutions or the permanganate may be employed. Chlorate of potassium is a favorite local remedy. Alum is, perhaps, the best of all applications when mixed with some fresh lemon-juice and water (1 : 40). Nitrate of silver has been successfully applied to the sloughing gums.

Internally there is generally no necessity whatever for any drugs, but where hemorrhages are extensive and threatening, ergot by the mouth or ergotine hypodermically should be resorted to. The astringent preparations of iron and the tincture of larch bark give good results.

Excessive salivation may be checked by atropine.

Massage and tonics, like quinine, iron, and arsenic, are indicated during convalescence, and hydropathy hastens recovery.

The danger of a fatal syncope when the patient assumes the erect position in bad cases must never be forgotten.

SEA-SICKNESS.

The usual advice of recommending a hearty meal before going on board is a mistake, and fasting is also to be avoided. A light meal at

least three hours before experiencing the ship's motion will put the patient in the best condition for struggling against this distressing malady. Of prophylactics there are hosts recommended, but few are of the least use to patients susceptible to sea-sickness. The best remedy, and one which undoubtedly often succeeds to preventing the attack, is the bromide of ammonium, sodium, or potassium. The first-mentioned is the most reliable. It should be given in 20-grain doses for a day or two before embarking. As soon as a susceptible patient gets aboard, he should lie down flat upon his back with his head low, and his eyes closed. A light abdominal binder, or pressure applied to the epigastrium is useful in many cases. The general advice given is to keep walking about upon deck is very good to travellers not markedly susceptible, and many such undoubtedly escape sickness in this way, but the very sensitive are sure to succumb if they adhere to it. One dose of chloral (20 grains), with the bromide may be tried when the voyage begins at night.

Chapman recommends ice to the spine, but its inconvenience is a barrier to its extensive trial.

Morphine, opium, cannabis indica; cocaine, chloroform, caffeine, atropine, alcohol, and nitrite of amyl have been recommended as prophylactics, but the writer has rarely found any benefit from them, though they all will give some relief after the vomiting or nausea has set in. Nitro-glycerin is often very valuable, but its use is unfortunately attended with such danger as prevents its being put into the hands of ordinary travellers. It sometimes does prevent sea-sickness, and the writer has observed a curious fact in connection with its action—viz., that if it fail to prevent vomiting, it often effectually removes the depression and apprehension accompanying the attack, some patients under its use feeling almost no nausea, though vomiting may be frequent, and a few apparently are almost able to enjoy the retching. Its danger lies in the possibility of the tablets (the only convenient form for administration) lying for a time undissolved in the stomach, and then getting into the circulation all at once. One of the tablets ($\frac{1}{100}$ grain) may be given every hour for four hours.

Nitrite of amyl may be used instead of nitro-glycerin, but its action is too fleeting. Antipyrine and antifebrin generally fail, their best effects are obtained when given frequently in small doses (2 grains), with cocaine ($\frac{1}{8}$ grain). For the relief of the vomiting, when once established, any of the anodynes already mentioned as prophylactics may be tried. Ice sucked in the mouth, or iced champagne, or an effervescing alkaline mixture is indicated. Sinapisms or anodyne liniments may be applied to the epigastrium. Hydrocyanic acid, bismuth, creasote, and the usual gastric sedatives may have a trial, and lozenges of eucalyptus rostrata are said to be very efficacious. Food should be insisted upon after a time, owing to the danger of exhaustion setting in upon long voyages, and the appetite may be assisted after vomiting has ceased by the administration of a bitter combined with a mineral acid,

as 15 minims of the diluted hydrochloric acid in a tablespoonful of infusion of gentian three or four times a day.

SEBACEOUS CYSTS.

The hair should be clipped close over the cyst when this occurs upon the scalp, and the skin cleansed by washing with a weak sublimate solution. An incision made with a fine scalpel suffices to permit of the shelling out of the cyst with its wall intact, the dissection being accomplished by a few strokes of the point or by the handle of the scalpel or blunt end of the forceps. Where these tumors are situated upon the face or forehead a very small incision into the skin and cyst-wall may be made, and by firm pressure of the thumb the sebaceous matter can be squeezed through the opening, after which the wall of the cyst should be forcibly dragged through the incision. It is more satisfactory to dissect out small cysts without rupture or extravasation of their contents, and no portion of their walls should be left behind. The lines of the incision should take the direction of any natural lines, furrows, or wrinkles, so as to avoid unnecessary marking.

The after-treatment of the wound is to be conducted upon general surgical principles, but by far the best way is that which the writer always employs, viz.: After seeing that the hemorrhage has ceased and the wound rendered thoroughly aseptic by the free use of carbolic lotion, the lips are brought together and by gentle pressure for a few minutes every trace of moisture is dried up by absorbent wool, when a few layers of collodion applied over the wound and neighboring skin fixes the edges of the wound together, and by its pressure as it dries up it prevents further oozing, and almost always insures healing by first intention.

The plan of causing suppuration by the application of caustics or the injection of irritants into the cyst has nothing to recommend itself. The injection of ether with the view of causing solution of the sebaceous matter and its subsequent absorption does not succeed.

Where the cyst has already suppurated it should be treated as an ordinary abscess by a free incision, and its contents may then be washed out by any antiseptic solution. After the subsidence of all inflammatory action the cyst-wall may be excised if it has not already sloughed out.

SEBORRHŒA—See Dandruff (page 166).

SEPTICÆMIA.

In a general sense it may be said that the first thing to be done is to find out and treat the cause. As this is generally the result of some wound or injury through which the septic material has gained access into the system, it will be found necessary to open it up and establish free irrigation by antiseptic solutions. In the case of poisoned wounds

it will be necessary to destroy any poison at the seat of its admission by strong caustics, after which the freest outlet is to be established and ample drainage provided for, and all tension effectually removed. Poulticing, as ordinarily carried out, is to be avoided, antiseptics being preferable. Constitutional treatment, as detailed under Pyæmia, especially pure air, abundant ventilation, milk diet, and strong soups at a later stage, with quinine, iron, salicylates, and the general remedies described under Pyæmia and Puerperal Fever, will be indicated.

SHINGLES—See Herpes (page 362).

SHOCK—See Collapse (page 133).

SLEEPLESSNESS—See Insomnia (pages 401 to 413).

SMALLPOX—See Variola.

SPERMATORRHŒA.

Under the heading of Masturbation the treatment of the common factor operating in the production of spermatorrhœa, in the great majority of cases, has been already detailed, and under Hypochondriasis, page 380, the treatment of the mental state so frequently associated with it is described. If any local condition is discovered it should be remedied without delay, as elongated prepuce, fissure of the rectum, hæmorrhoids, balanitis, phymosis, etc., the treatment for which affections will be found in their proper places in the present volume. If the exciting cause of the discharge (which occurs without any sexual excitement) is remedied, the mental and physical condition may be expected to improve.

Lallemand's treatment still finds acceptance with many surgeons. It consists in cauterizing the prostatic portion of the urethra by means of a solution of nitrate of silver (30 grains to 1 ounce) and a urethral syringe, or by applying the solid caustic with an instrument devised for the purpose.

Phosphorus, arsenic, chloride of gold, electricity, massage, and the general treatment recommended under the head of Impotence, page 391, may be resorted to in suitable cases, but more frequently the remedial and moral agents detailed under Hypochondriasis, on page 380, will be indicated.

SPINA BIFIDA.

Of all the methods of treatment, the one now most frequently carried out is a modified form of Velpeau's operation. Until the infant's health and strength have been brought up to the standard requisite for an operation by judicious feeding and skilful nursing the operation should not be undertaken, the tumor being in the meantime protected by a layer of collodion, cotton wool, and a shield of gutta-percha

modelled to suit the part. The tumor should be punctured through the healthy skin near to its base by a fine needle, and from one-third to one-half of its fluid contents removed, after which about one drachm of the following solution is to be injected. Large tumors may receive double this amount; half a drachm will be sufficient for small ones:

℞.—Iodi purif.	gr. x.
Potassii iodidi	gr. xxx.
Glycerini	℥j.—M.

It will be advisable to place the child upon its face during the operation and to carefully close the punctured opening by gentle pressure and collodion. One injection sometimes suffices, but it often may require several, the greatest care being taken to prevent injury to or rupture of the sac and loss or draining away of the cerebro-spinal fluid.

The operations of simply painting with collodion, tapping followed by compression, introducing setons, ligaturing the tumor, or excising a portion of the sac, being very seldom successful, and, except the first-mentioned, they are generally very dangerous.

Recently Carl Bayer recommends the treatment of the tumor as if it were a hernia. He dissects out two lateral flaps from the skin covering it and removes the sac, leaving only two lateral flaps of the dura, which he sews together after rendering the wounds aseptic, the skin and muscles being afterward brought together separately. He also suggests that two lateral periosteal flaps may be dissected from the canal of the sacrum in order to make a bony roof over the sewed sac.

SPINAL CURVATURE.

Under Caries, page 111, the treatment of antero-posterior curvature, or Pott's disease, is detailed.

Lateral spinal curvature, if seen to before osseous permanent deformity has become established, yields rapidly to treatment. When confirmed structural nerves exist, treatment is practically useless.

In the early stages of the affection, all that is required is attention to the general health, suitable gymnastic exercise, and the avoidance of those habits and postures which have led to the development of the affection. The use of spinal supports, and rest for some hours during the day upon a couch, or confinement to bed, are positively injurious.

Roth places the patient in a perfectly normal position (this is very easy in most cases where osseous permanent deformity has not set in), and he insists upon his maintaining this posture before a mirror, lying, standing, or sitting at regular intervals until his perverted muscular sense is restored. As soon as this occurs, the patient begins to realize that the easiest position has hitherto been the abnormal one. By

close attention afterward to the strict maintenance of the improved position in standing, sitting, or walking, a rapid cure results. In his able article in Heath's *Dictionary of Surgery*, a list of elaborate exercises are minutely given, to which the reader is referred. Games of all kinds, including rowing and lawn tennis, with the ordinary gymnastic exercises, may be freely indulged in in all cases of lateral curvature, short of causing severe fatigue or after-pain. The writer, contrary to the advice of some surgeons, always recommends swinging upon the horizontal bar, and finds that the improvement in the rapid development of the muscles of the back often effects a very speedy change.

Where there is marked paralysis of the erectores spinæ muscles, so that the patient is unable to assume an improved position, the use of a spinal support taking its fixed point from the pelvis, and lifting the weight of the head and upper extremities off the spine by means of two crutches made to fit into the armpits, affords considerable relief.

As long as there is any hope of development of the weakened muscles in spinal curvature, however, these appliances do harm.

They may occasionally serve in arresting the formation of permanent curves in rapid cases, but then only by being regularly used in conjunction with gymnastic exercises.

Even in the most advanced cases of osseous deformity, their constant use often does harm, and the persistent employment of judicious gymnastic exercises may afford great relief to the wearying pains felt in the back and chest.

Massage and electricity applied to the muscles of the back may do much when tried in conjunction with the above methods.

SPRAINS.

The treatment will vary with the time that has elapsed between the receipt of the sprain and the surgeon seeing the case.

If seen immediately, or very soon after, before swelling has occurred, the writer has found the following simple plan act most satisfactorily in some cases: A rubber bandage is applied with moderate pressure to the joint, and the bandaged joint is placed under a cold water tap for as long as the patient can bear it. By this method sometimes the duration of the treatment may be limited from days or weeks to hours. If the pressure begins to give severe pain, the bandage must be taken off, and cold water applications continued.

This combination of firm elastic pressure with continuous cold is the best measure when the sprain is seen early. Ice-bags, or an irrigation apparatus, or ordinary cold evaporating lotions containing chloride of ammonium, lead or spirit, may be used instead, though, of course, these latter are only of use after the removal of the bandage.

The plan of immediately enveloping the sprained joint in a firm plaster or starch bandage is highly recommended by many authorities, but the feeling that one cannot see what is going on under these when

pain afterward becomes severe, as it does in some cases, renders the mind of the patient or of his attendant uneasy, and the removal of such a bandage over a swollen limb is no easy matter. A properly-applied bandage should prevent swelling, but sometimes it does not, and then it is exceedingly painful.

Warm applications are the most comfortable where severe pain and swelling have occurred before the surgeon has seen the case. Warm or hot fomentations or a good poultice is sometimes very soothing. Putting the limb into as hot water as the patient can bear may be tried. Upon the whole, however, the best all-round method is to envelop the joint with strips of lint soaked in the following lotion, or in spirit lotion (1 : 4), and then to carefully cover over with oiled silk or thin mackintosh, kept in its place by a light bandage:

℞.—Liq. plumbi subacetat. ℥j.
Tinct. opii ℥ij.
Acid. acetic. dil. ℥ij.
Aquæ ad ℥xx.—M.

This may be applied warm. It also serves well if used as a cold evaporating lotion.

Leeches applied to a very swollen and painful superficial joint often give more relief than anything else.

Absolute rest is to be rigidly maintained until after the subsidence of the acute symptoms, and the starch or plaster bandages secure this most effectively when they can be tolerated. Any form of splint may be adjusted to the limb. As a rule, in ordinary practice, one generally finds that the rest is liable to be maintained for too long a period, and the method of keeping a plaster or starch bandage for six or eight weeks upon a sprained joint is to be condemned. Passive movements, friction, and massage may be commenced as soon as the disappearance of the pain and swelling. The too early use of the limb may lead to a slow convalescence, but the great majority of cases of stiffness and impaired use of joints after sprains are caused by an unnecessarily prolonged rest, which sets up changes in and around the joint.

Mild sprains may be successfully treated by massage from the first. The patient should not be permitted to use the joint himself, or to place the weight of his body upon it until passive movement, massage, etc., can be tolerated without pain. In even the worst cases these agents may be commenced before the end of the third week. Strapping, consisting of soap or lead plaster spread upon any strong material, may be applied neatly round the joint in bad cases before the patient is allowed to move about.

SQUINTING.

The first consideration is to find out the cause and treat it, and if possible secure its removal.

Ordinary convergent strabismus is so very often the result of hypermetropia, that atropine, in the majority of cases, will remove for the time the squint by paralyzing the ciliary muscles and putting an end to the attempts to accommodate. Sometimes eserine, by stimulating the muscular movement, will, by acting in the opposite way, remove the deformity for a short time.

By correcting the hypermetropia, in some cases the strabismus can be prevented, but in the majority of cases the use of convex glasses fails, owing to the changes which have already taken place in the relations between the actions of the external and internal recti muscles. In all young subjects they should have a fair trial, especially where the squint is alternating and vision not permanently damaged. When this has threatened in young subjects the vision of the squinting eye should be treated by forced exercises.

Where these measures fail, tenotomy of the internal rectus in one or both eyes must be resorted to. This should not be done sooner than the eighth year, by which time the patient will be able to wear glasses. It may be necessary to operate sooner if there are signs of the vision becoming affected, though by closing the good eye several times daily and exercising the weak one this generally may be prevented and operation put off until the age specified.

As it is often impossible to predict the exact amount of correction resulting from the operation, a second operation may be required, and where there is very marked strabismus it is better to operate upon both internal recti at the same time.

After thoroughly rendering the conjunctiva insensible by cocaine, the tendon may be easily divided without giving any pain. The first step after the introduction of the speculum is to snip up a portion of the conjunctiva by forceps, and with the scissors produce an opening through which the hook and the blades of a pair of fine scissors may be passed, and as the tendon is caught by the hook it is divided by the scissors close to the sclerotic.

Convergent strabismus, the result of myopia, is generally remedied by suitable glasses, but where these fail, tenotomy should be performed.

Paralytic convergent strabismus must be treated by remedying the underlying mischief, which may be syphilitic, being often caused by the presence of gummatous tumors behind the orbit or by syphilitic affection of the orbital bones. While mercury or iodide of potassium is being employed, it will generally be found necessary to remedy the double vision caused by the strabismus by means of closing up one eye, and at several times during the day the affected eye should be exercised, so as to prevent wasting of the paralyzed muscles. For the same reasons massage and electricity may be used, and in very bad cases tenotomy will be required.

Divergent squint is a more troublesome affection to remedy. The very mild forms may be sometimes removed by suitable concave glasses, to correct the myopia which is often the cause.

The external rectus will require tenotomy, while the internal rectus must be shortened or advanced. Success will to a large extent depend upon the state of the vision of the affected eye.

Javal has recently reported a case where tenotomy had been performed on both eyes with unsatisfactory results, but success followed the use of the stereoscope after the patient had for a considerable time worked twelve or fourteen hours daily trying to produce single vision.

It must be remembered that after tenotomy for strabismus the squinting eye must be constantly and steadily exercised, otherwise the sharpness of vision will not be improved.

STAMMERING.

After remedying any local abnormalities or diseased conditions of the mouth, throat, or air-passages, the treatment must be purely educational. The greatest slowness and deliberation must be maintained during the necessary vocal exercises. Nothing, however, will be gained without the exercise of much patience.

The patient should read aloud slowly with a good teacher, practising over and over again the combinations of sounds which give the greatest difficulty, with patience and deliberation. In very bad cases a beginning may be made by singing or intoning, after which, by repeated exercises in loud, slow reading, improvement will gradually show itself.

Rules are useless for such exercises. The assistance of an experienced teacher is of all things the most important, and the patient should be educated as far as possible to refrain from speaking when under the influence of nervousness, excitement, or passion.

Corval has reported astonishing results from hypnotism, the effects being speedy, and in some cases complete cure results.

Various drugs, as bromides, hyoscyamus, stramonium, etc., and most antispasmodics have been tried, but they are useless as a rule.

STARVATION.

The obvious remedy for this condition is food, but the most cautious and discreet exhibition of aliment is essential. Death rapidly supervenes in many cases where the sufferer is permitted to suddenly satisfy the cravings of hunger following a forced abstinence from food. The most easily digestible substances should be sparingly administered at very short intervals, and milk, beef tea, or meat juices afford the safest means of supplying these. Solids must be sparingly administered for some time, or entirely withheld until the digestive organs recover sufficient tone. White fish, boiled, is the best form in which to commence the exhibition of solids. Children and infants, upon being rescued from a state of acute or chronic starvation, do best upon diluted warm peptonized milk.

A matter of vital importance, which may be readily overlooked in

these cases, is the state of the body temperature. In starvation this falls so low as to cause death, and life may be saved in some cases by a prompt application of dry heat to the body of the victim rescued from starvation. In some cases heat is more urgently demanded than food. It is advisable to apply hot water bottles and warm flannels or cotton wool rather than at first to attempt friction or massage, which might possibly, under such circumstances, extinguish life.

In the voluntary starvation of lunatics, the gag and the rubber tube of a stomach pump may be employed to convey liquid food into the stomach, or, where there is difficulty in introducing the tube through the mouth, it may be sometimes passed along the floor of the nares.

STERILITY.

Though there should be a clear line drawn between impotence and sterility, the reader is referred, in connection with this subject, to the article under Impotence upon page 391.

The treatment of sterility in the male will resolve itself into the remedying of the causes, as far as these are capable of remedy. Where impotence is absent, and the sexual act is performed in the normal manner, but where there is absence of spermatozoa from the seminal fluid, little need be expected from any method of treatment unless in those rare cases where the azoöspermatism is caused by some temporary obstruction of the efferent ducts of the testicles, as from *recent* epididymitis, when appropriate remedies may be of use. Should this condition depend upon exhaustion from *recent* venereal excesses, without impotence, abstinence will generally correct it in a short time; but where prolonged abuse of the sexual instinct has led to marked atrophy of the testicles, no medication will be of the least use in cases where spermatozoa are absent from the seminal discharge, or in cases where both testicles are retained in the canal or abdomen.

In sterility caused by absence of the seminal emission at the time of sexual intercourse, if this depends upon any mechanical impediment, as phymosis, hypospadias, diseases or concretions in the prostate, stricture of the urethra, etc., it may be remedied effectually by removal of these causes.

Where, from nervous or physical causes, the discharge of seminal fluid is delayed or absent, though the sexual act may be otherwise successfully performed, treatment generally is of little avail, though in such comparatively rare cases the remedies mentioned under impotence, as phosphorus, strychnine, electricity, etc., may have a trial. Curling and McCarthy recommend the application of blisters and irritants to the glans and penis in those cases characterized by deficient sensibility of this portion of the genital apparatus.

Sterility in the female often depends upon remedial causes, and it must be borne in mind that not unusually more than one cause may be present at the same time, and the mistake should not be made of

stopping short of correcting abnormal conditions of the various parts of the general tract. Details of treatment here are unnecessary, as they are supplied under the different headings of the abnormal or diseased condition interfering with conception, as Uterine Displacements, Metritis, Leucorrhœa, Ovarian Disease, Gonorrhœa, Vaginismus, Dysmenorrhœa, Tumors, Salpingitis, Syphilis, Obesity, etc.

STINGS.

In the case of wasp and bee stings the immediate application of liquor ammoniæ gives almost instantaneous relief. Sal volatile answers the same purpose, but acts less rapidly. Where the sting is left in, it should be extracted by forceps, and in the coarse skin of the palms of the hands or soles of the feet the strong liquor may be applied. Alkaline carbonates may be employed in the absence of ammonia. Thus a strong solution of carbonate or bicarbonate of sodium or potassium may be tried. Chloroform or strong oil of peppermint gives relief, and a little pure carbolic acid may be applied on the end of a match to the puncture, or carbolic oil (1 : 8) may be more freely applied.

If erythema and swelling have already appeared, ammonia may increase the irritation. In such cases a poultice with some alkaline solution, as lime-water, sprinkled over its surface acts well.

Peppermint oil relieves the pain and irritation of mosquito bites, and pennyroyal oil (hedeoma pulegioides) is much used both as a remedy and preventive. Camphor, oil of cloves, oil of cinnamon, and oils of rosemary, eucalyptus, or cajuput act in the same way as preventives. Poultices of ipecacuanha and mint leaves relieve mosquito bites. Scorpion stings are also successfully treated by ammonia and chloroform, alum, and carbolic acid.

Where sudden collapse follows the stings of bees, wasps, or scorpions, ammonia and brandy or whiskey internally may be urgently required. Spider bites are best treated by carbolic acid, and sometimes a small incision to permit the entrance of the acid into the immediate region of infection. A ligature around the limb if applied at once in the absence of remedies, will give time for the destruction of the poison by sucking, washing, or cauterizing the spot in cases where a severe or dangerous result might be anticipated.

STOMACH, Diseases of—See under Dyspepsia, Gastralgia, Gastritis, Gastric Ulcer, Cancer, etc.

STOMATITIS.

Under cancrum oris (page 109), the treatment of the gangrenous variety of stomatitis is described. For the catarrhal, ulcerative, and follicular varieties the treatment is simple, and may be carried out upon much the same lines as that of aphthous stomatitis (page 51).

Diet should be as nutritious as possible, and for children peptonized milk foods or peptonized beef-tea and chicken soups are required. In all cases of severity a liquid food is necessary, and upon investigation, something will generally be found to have been wrong with the feeding and general management of the patient prior to the attack. This should be corrected at once. Food should be properly cooked and given at proper intervals. Pure fresh air and sunlight are necessary and everything that can place the patient in the most favorable hygienic condition should be resorted to. Local treatment is of importance, and all cases generally soon yield to the continuous use of the glycerin of borax (1 : 4). This preparation should contain no water, as it should be of such consistence as to adhere to the mucous surfaces. It should be applied by means of a brush or by the finger every two or three hours.

In the cases of minor severity coming on during the course of other diseases in adults, the writer's plan is to give one large crystal of borax to the patient, with directions that he is to lick it frequently through the day.

Chlorate of potassium, in the form of tablets, is an excellent remedy. One may be kept in the mouth and allowed to dissolve very slowly. Like borax, if its use be continued after the disappearance of the stomatitis, it may set up an irritation of its own, which, however, ceases as soon as its use is suspended. It is frequently used in solution ($\frac{1}{2}$ ounce to 1 pint). Boric acid (1 : 30), carbolic acid (1 : 100), glycerin of alum (1 to 5), salicylate of sodium (1 : 20), or lime-water may be used.

The occasional use of a weak solution of corrosive sublimate, 1 grain in 6 ounces distilled water, is advisable in the stomatitis of adults.

Where ulceration is extensive the sores may be touched with solid nitrate of silver, or brushed over with a strong solution. The sulphate of copper, burned alum, and strong hydrochloric acid are used for this purpose. A weak solution of permanganate of potassium may be frequently used where there is much fetor.

Where bleeding from the ulcerated spots occurs vegetable astringents as decoction of oak bark, rhatany, myrrh, etc., may be useful.

Where the state of the mouth is such as to render feeding very painful, cocaine may be employed, or even forced feeding with a rubber tube, or rectal alimentation may be resorted to.

Of internal remedies none equals a combination of iron and chlorate of potassium, which may be safely given at all ages:

℞.—Potassii chlor. ℥ss.
Tinct. ferri chlor. ℥ss.
Glycerini ℥j.
Aquæ dest. ad ℥xij.—M.

S.—One tablespoonful four times a day in a little water.

Infants may take a small teaspoonful of the above.

Tincture of cinchona may be added where there is much depression, and cod-liver oil is always useful.

Mercurial stomatitis is best treated by constant washing out of the mouth by means of chlorate of potassium washes (1 : 30); in the intervals the tablets of the same substance may be employed, and where there is much fetor chlorine solution or permanganate may be freely used. At a later stage the vegetable astringents are indicated.

Internally chlorate of potassium is the best remedy, and it is hardly necessary to state that mercurials are to be suspended.

For the not uncommon condition known as "spongy gums" generally depending upon an abnormal condition of the secretions of the mouth, or upon the presence of tartar, attention to the general health, especially to the gastric or digestive functions, and the removal of tartar, are essential. Chlorate of potassium may be used in the form of tablets, and the following local application is of the greatest value:

℞.—Tinct. myrrhæ
Tinct. krameriæ
Tinct. cinchonæ
Tinct. catechu comp. } āā ℥ss.
Eau de Cologne ℥j.—M.

S.—A large teaspoonful in a wineglassful of water to be used as a mouth-wash frequently.

STONE IN THE KIDNEY.

The treatment of this generally very painful affection will depend upon the stage of the disease or upon the symptoms present when the case first comes under notice.

Renal colic, or the pain produced by the calculus finding its way into the pelvis of the kidney or into the ureter, is best relieved by a hot bath given as soon as possible after the commencement of the attack. The patient should remain in the bath under the charge of a discreet attendant until the full antispasmodic effect of it is observable, *i. e.*, until he complains of weakness or a feeling of syncope. This is undoubtedly the best routine treatment to adopt whenever it is available. Under its influence the spasm of the ureter may relax, and small calculi may find their way speedily into the bladder. Opium in small doses (15 minims of the tincture) may be given every half hour for three or four hours if the agony is severe, and this drug may be commenced while the bath is being prepared, and it may be continued during immersion.

Morphine hypodermically gives the speediest and most effectual relief, and it may be resorted to immediately when the pain cannot be tolerated. One-third or one-half grain may be injected under the skin in the neighborhood of the affected kidney, but, upon the whole, it is wiser

to wait until after the hot bath has been taken, when, if relief be not obtained, it may be injected as the patient is put to bed with warm water bottles applied to his loins.

The physiological effects of the drug should be produced, and as these require very large doses in many cases, the writer's routine practice is to give first a full dose of whiskey (1 to 2 ounces), and then the hypodermic of morphine, combined with two minims of the (1 : 100) solution of atropine. With these precautions, full doses of the drug may be given safely. Moreover, the action of the atropine assists that of the morphine, while it prevents any depressing effect upon the heart. In patients subject to attacks of renal colic it is a good plan to advise a large warm water enema, followed by a morphine suppository (½ grain), to be used as soon as the attack threatens, while the bath is being prepared. The temperature of the bath should commence at 100° F. and be raised to 104° or 106°. A hot pack may be resorted to in the absence of the bath.

Hot stupes to the loins, hot poultices, and cupping may be resorted to with advantage. Manipulation of the ureters through the abdominal walls and inversion of the body have sometimes given good results.

Local anodynes have little effect; and the new analgesics, as anti pyrine, exalgine, etc., generally fail entirely.

During the intervals of the attacks an attempt may be made to carry out Roberts' plan of dissolving the calculus. This need only be thought of where there is reason to believe that it consists of uric acid, urates, or cystine, all of which are soluble in alkalies. If the stone should consist of oxalate of lime the alkaline treatment will do no harm, and in all cases where the urine is acid the alkaline solvent method should have a full and fair trial, especially as it can do no harm, and in the majority of cases no other plan is available. The writer believes that he has obtained good results by the use of alkalies in full doses.

Roberts insists that, to be of any use, the urine must be kept *continuously* alkaline for long periods. The dose must be given every three hours at least during the waking hours, and during the night when the patient is awake. The citrate and the acetate of potassium, in doses of 40 to 60 grains dissolved in 3 or 4 ounces of water, are the best alkalies, and he advises that the citrate from the shops is not to be relied upon, but that it should be prepared fresh by neutralizing the crystallized bicarbonate with crystallized citric acid, as in the following formula:

℞.—Potassii bicarb. ℥xx.
Acidi citric. ℥xiv.
Aquæ dest. ad ℥xx.—M.

This yields one drachm of the citrate of potassium in each fluidounce, the dose for adults being 6 to 8 drachms in a claretglassful of water, and for children half this amount.

Hæmaturia and other symptoms, when they show themselves, must be treated by absolute rest and the appropriate remedies mentioned under their separate headings. (See Hæmaturia, Pyonephrosis, Hydronephrosis, Pyelitis, etc.)

If the symptoms warrant a positive diagnosis, and by their severity render the patient's life unbearable, an attempt should be made to remove the stone. Where there is no evidence of any suppuration or disorganization of the renal organ present, the operation of nephrolithotomy has given brilliant results in some cases. Its mortality when performed early is exceedingly low in all cases where there is no disorganization of the gland. It is practically the same operation as nephrotomy, only, owing to the absence of the great enlargements usually met with in cases where the kidney is enlarged or extensively diseased, the operation is often more difficult. It is rather unfortunate to call the operation by different names—viz., nephro-lithotomy when it is performed upon a healthy kidney, and nephrotomy when the same operation is performed upon a kidney the seat of pyelitis, pyonephrosis, etc.

The operation itself consists of making a free incision into the kidney. The organ is reached by making an incision in the lumbar region between the last rib and the iliac crest at the external border of the erector spinæ. When the kidney is reached and carefully explored, a free incision is made into its substance or into its pelvis and the calculus removed; the wound afterward being thoroughly drained by a tube passed down into the incision in the renal substance or its pelvis, the strictest antiseptic precautions being maintained before and after the operation.

Where extensive disorganization of the kidney is found to be present, the operation of nephrectomy or removal of the whole kidney may have to be carried out. If this is contemplated from the first, it may be performed by abdominal section in the middle line, or by an incision through the linea semilunaris; or if a nephrotomy or a nephro-lithotomy is attempted at first, the entire organ can be removed through the lumbar incision by modifying the procedure when the examination shows that the kidney itself must be removed.

In those rare cases where a calculus blocks up one ureter, the opposite organ having been rendered useless by a similar event some time previously, there is little hope for the patient unless the recently-formed stone descends into the bladder. In such an instance abdominal section may be imperative in order to give the patient the only chance for his life. There have been recent successes following this bold procedure. The writer had such a case lately, but unfortunately the calculus descended into the pervious ureter just at the time of parturition, and an abdominal section under such circumstances was regarded as hopeless.

STONE IN THE BLADDER.

In the case of the female the treatment of this affection is a simple matter in the majority of instances. Dilatation of the urethra by the blades of a stout pair of dressing forceps, or by an instrument devised for the purpose, should be performed, and if extraction of the stone is not easily affected after being seized by suitable forceps, it can be crushed by a lithotrite and removed at once. The writer years ago had several cases of stone in children, and no incontinence followed the dilatation of the urethra to the extent of admitting the little finger and exploring the bladder. Soft stones can be safely broken up by a pair of necrosis forceps, and the fragments extracted, taking care not to cause laceration of the passage or injury to the neck of the bladder. Large stones must be crushed with the lithotrite, but if of very great size and hard they may be removed by the vagina or by the supra-pubic method.

In males the operation is, of course, very different. Should solvent treatment have a chance? Nearly every surgeon answers this strongly in the negative, nevertheless there is unquestionably sufficient evidence to show that in a narrow minority of cases it should have a trial. As pointed out by Roberts it is absolutely useless in all cases where the urine is ammoniacal, and in all cases of oxalate of lime and phosphatic calculi, and it is only applicable in those cases of vesical calculi in which *the urine is acid; the stone not large;* its composition *known to be, or strongly suspected to be, uric acid.*

In a patient who has recently had an attack of renal colic, followed by evidence that the stone has descended into the bladder, where the urine is acid, and where a former uric acid stone or uric acid gravel had been passed, the writer is satisfied that the only course open (in the absence of severe bladder disturbance) is to give the continuous alkaline administration a fair trial, but it must be rigidly carried out as described upon page 788. He has satisfied himself often that strict adherence to this method will facilitate the passage of uric acid stones through the urethra, which might not otherwise have been voided, but, of course, such an opinion is not worth much if one only lets one's mind dwell upon the fact that the great majority of stones passed down the ureters into the bladder are expelled in the urine.

If upon sounding, a stone is struck, the generally accepted rule is immediately to consider whether the case is one for lithotrity or lithotomy, it is difficult to decide the size of the calculus, but in the great majority of cases coming under the care of the surgeon that is already so large as to be considered out of the reach of solvents. The writer once got a clear tinkle from a stone not much larger than a red currant. Perhaps one of the reasons why the solvent method meets with so little sympathy from the surgeon may be owing to the fact that the specialist does not, as a rule, get the cases in as early a stage as they are met by the physician.

There are sufficient cases on record to show that phosphatic calculi

may be dissolved by injections of diluted nitric acid into the bladder (1 of the dilute acid to 80), but the process is surrounded with such difficulties in carrying it out that it has been little practised. It may, however, be resorted to in the intervals of crushing such stones where phosphatic deposits are taking place as they do sometimes with rapidity upon the fragments before their emission. Alkaline injections into the bladder for uric acid calculi are not to be undertaken when the stomach answers the same purpose so readily. The solvent action to be of use, as already pointed out, must be practically continuous and must be carried out for many weeks. This can be done without any danger to health, as is seen at Vichy and other alkaline springs.

Notwithstanding all that can be said for the solvent treatment, it is a very trivial minority of cases coming under the care of the surgeon in which it can be successful, and the practical question in the treatment of stone is to decide the question of crushing or cutting.

In children the cutting operation has generally been preferred; but since the introduction of litholapaxy by Bigelow, in which the stone is crushed and its fragments removed at one sitting, some boys who formerly would have been submitted to the cutting operation are now successfully operated upon by the crushing method, and Marshal and many others believe that the cutting operation, even in the case of boys, should be now seldom resorted to. It must, however, be remembered that the cutting plan in children is followed by such a very low mortality that it will be long before it will go out of fashion.

In adults, with calculi under one and a half to two inches, lithotrity should have the preference. Large stones should be removed by the suprapubic method. Very hard uric acid or oxalate of lime calculi may resist the lithotrite, and then lithotomy must be resorted to; but, upon the whole, there cannot be any doubt but lithotrity is all round a safer operation, and the number of cases in which it is inadmissible is small. Stricture of the urethra and enlargement of the prostate are no barriers to crushing. The urethra may be gradually dilated by solid metal bougies up to No. 16 just before the operation, and with prostatic enlargement the washing out apparatus overcomes all difficulty.

Deformity of the urethra, as may be seen in rare conditions where some old injury or abscess has led to its cicatrization, may demand lithotomy. The scale between the two operations may also be turned by a very unhealthy and irritable state of the bladder. Where there is evidence that the kidneys are diseased and an operation is imperative, crushing is safer with any reasonable sized calculus. If a foreign body (catheter, etc.), is known to form the nucleus of a calculus, cutting must be determined upon.

Lithotrity is now carried out, generally at one sitting, by removing all the crushed fragments and *débris* by means of a suction apparatus. It is considered necessary to give an anæsthetic or inject 1 or 2 drachms of a 4 per cent. cocaine solution. Much will depend upon the patient,

upon the state of his bladder, and upon the size of the stone. Once the writer had to crush a small stone in a patient who could not bear an anæsthetic (before the days of cocaine), and he was surprised to see how little pain need be inflicted during the operation. In cases where the crushing, except of very small stones, is to be carried out at one sitting, the use of the anæsthetic is necessary. The patient being placed upon his back, with the pelvis slightly elevated, and the operator standing upon his right, the lithotrite, well lubricated, should be passed gently into the bladder. Before operating it must be seen that the bladder contains at least a couple of hours' urine; if not, 4 or 5 ounces of warm boric acid solution may be gradually injected.

As the lithotrite glides into the bladder the handle is raised, and the female blade pushed gently down, so as to slightly depress the floor of the cavity. When this manœuvre is skilfully executed the stone often drops into the blade, and is seized in position by the male portion of the instrument and crushed. Where this plain fails, the lithotrite, with its open blades, is turned from side to side or inverted so as to pick up the calculus from the floor of the bladder. This latter method suits best in all cases where the prostate is enlarged.

After screwing home the blades they are again separated, and any large fragments picked up in turn and crushed. The same lithotrite will do in most cases of small stone, but for large ones some operators prefer to crush first with a strong instrument, and then use a small one for the fragments.

The lithotrite should not be withdrawn until it is screwed tightly home. The evacuating catheter is then introduced, and the aspirator attached. A stream of water is sent into the bladder by a sharp squeeze of the rubber bottle, and, as the pressure is withdrawn, the water is sucked back, bearing detritus and small fragments with it, which fall into the glass reservoir. If the fragments are not all removable a second or third crushing of them may be necessary, using the aspirator after each operation, until every particle of the stone is removed when possible. With a very neat and careful operator no blood may be seen in some cases, and little irritation may result with small stones.

The after-treatment consists in a morphine suppository, diluent drinks, rest in bed, warm baths, a few drops of boric acid, and a restricted diet. If cystitis follow, it must be met by the remedies detailed under its own heading.

Lithotomy aims at removing the stone by an incision into the bladder where it is uncovered by peritoneum, either through the perineum or above the pubes. Only the merest outline of these operations need be given, with the view of refreshing the student's memory.

The lateral operation is performed by incising the membranous and prostatic urethra and the left lobe of the prostate.

After the rectum has been emptied, and the patient placed upon a suitable table in the lithotomy position, by the assistance of bandages or anklets or Clover's crotch, and under the influence of an anæsthetic,

the staff is passed into the bladder and made to strike the stone. The bladder should be moderately full. The staff is then entrusted to a reliable assistant, who holds it firmly up hooked under the pubic arch. The operator introduces his finger into the rectum, and takes the bearings of the various regions, feeling for the apex of the prostate and the staff, and, feeling all satisfactory, he withdraws the finger again.

An incision about three inches long is made in the shaven perineum, commencing about one inch and a half above the anus, just to the left of the middle line, and carried outward and downward toward the ischial tuberosity, about one inch and a quarter outside the anus, through skin and superficial fascia, but without striking the staff, which is to be felt for by pressing the left index-finger into the upper end of the wound. As soon as the groove is felt, the point of the knife is inserted into it, and the membranous portion of the urethra divided as the knife is pushed along the groove until the bladder is reached, cutting the left lobe of the prostate and neck of the bladder. If the stone is a large one, the incision may be increased as the knife is withdrawn by allowing it to leave the groove, or by thoroughly lateralizing it, with its back kept firmly in the groove. If the straight staff has been used, the operator at this stage takes the staff in his left hand after inserting the point of the knife into its groove, and rotates it until the proper angle is obtained, when the prostate is divided as the knife enters the bladder.

After the withdrawal of the knife, the left index-finger is introduced along the staff into the bladder, and when the stone is touched the staff may be removed. A pair of lithotomy forceps are now guided along the finger, the stone seized, and extracted. The gush of urine following the withdrawal of the left index-finger generally carries the stone between the open blades of the forceps.

The patient should be put to bed with a pillow under his knees, and a good draw sheet. An anodyne may be given, and a light diet administered.

The median operation, which is becoming less employed, is only suitable for small stones. After the patient has been placed in the usual lithotomy position, a curved or rectangular staff, with a median groove, is passed into the bladder, and held by an assistant as in the lateral operation. The operator then passes his left index-finger into the rectum, with its palmar surface upward, and the tip resting against the apex of the prostate. A long, straight bistoury is entered half an inch in front of the bowel, passed through the raphé with its back to the bowel, until the staff is reached at the apex of the prostate, and after being pressed for a short distance toward the bladder, it is made to cut upward, dividing the membranous portions of the urethra to the required extent. The finger is then introduced into the bladder upon a blunt probe, and the stone caught and extracted as in lateral lithotomy.

The supra-pubic operation is now performed for large calculi in the

following manner: The urine is drawn off by the catheter, and the bladder is *filled* with warm boric lotion, and this is kept in by a ligature around the penis. The rectum is filled by a thin rubber bag, into which 10 to 15 ounces of warm water are injected. By these means the fold of peritoneum is lifted high up out of danger from the knife, and the bladder pushed up in the pelvis. An incision about three inches long is made in the middle line above the pubes through the linea alba, and by the finger-nail, a blunt director, or the handle of the scalpel, the fat is dissected aside until the bladder is reached. This is fixed by a tenaculum, and opened behind the pubes, so as to make an entrance for the finger, which, after measuring the stone is withdrawn, and the opening enlarged to the required extent, or the opening may be enlarged, the finger acting as a director, after which the stone is extracted by suitable forceps. As regards the after steps, there is much diversity of opinion, some operators simply leaving the bladder and skin wounds open, others insert a long rubber tube into the bladder, others suture the bladder wound, and some insist upon a catheter being tied in the urethra. Attention should be paid to the position of the patient, so as to insure the most thorough drainage.

STONE IN THE URETHRA.

With a calculus impacted in any portion of the passage, it is well not to think of pushing it back into the bladder until other measures fail. By skilful manipulation a small stone may be pressed forward by a gentle kneading movement, executed by grasping the penis between the fingers if in the penile portion of the urethra.

By stopping the flow of urine for a little, and suddenly causing a quick contraction of the bladder and accessory muscles, it may be squirted out if the obstruction is not complete.

A pair of urethral forceps may be passed down to the impediment, and, aided by external manipulation, the operator will often succeed in seizing it.

A scoop or loop, such as is used for the removal of foreign bodies from the ear, may be passed beyond it, care being taken by external pressure to prevent its return to the bladder.

If failure attend these methods, an incision may be made and the stone pushed out from behind by a probe or catheter introduced into the wound. When far back, the median lithotomy operation may be tried. In adults it is better, when extraction fails, to push the stone back into the bladder by a blunt bougie, or by a catheter with the opening at the very point. When forced back, it can be easily crushed by a fine lithotrite in the bladder.

As the stone is brought forward, if extraction by scoop, forceps, or external manipulation succeeds, it may be found to stick fast in the fossa navicularis, from which it may be only possible to release it by incising the meatus.

In neglected cases, where extravasation of urine has already occurred, free incisions into the perineum and surrounding tissues must be made without delay, after which the calculus may be removed by cutting down upon a staff passed as far as the obstruction.

STRANGURY.

The cause must be first found out and removed, when this is possible. Stone in the bladder, ureter, or urethra, or inflammation of these parts may exist, and their proper treatment will be found detailed under their separate headings. (See Stone, Cystitis, Bright's Disease, etc.)

Where the symptoms are caused by the external or internal use of cantharides, or by the administration of copaiba, sandal wood, or turpentine, the use of the drug should be instantly suspended.

A good hot bath or hot sitz bath, with warm diluent drinks, or iced water, a morphine suppository in the rectum, followed by continuous hot fomentations applied to the perineum, and, in very painful cases, a hypodermic injection of morphine and leeching may be tried. Blisters should be used with great caution on patients the subjects of Bright's disease or bladder affections, and in young or debilitated persons. When necessary in these cases, they should not be kept on for more than two or three hours, and after their removal a poultice should be applied.

STRICTURE OF THE GULLET.

Under Cancer of the Gullet (page 101) the treatment of malignant stricture is described. Under Œsophagus, Stricture of, upon page 551, the treatment of simple stricture is detailed.

STRICTURE OF THE INTESTINES—See under Intestinal Obstruction, page 415.

STRICTURE OF THE RECTUM—See under Cancer of the Rectum, page 105.

STRICTURE OF THE URETHRA.

The applicability of the various methods of treating the varieties of this condition will be referred to later on. The method of intermittent or interrupted dilatation is applicable to the great majority of organic strictures through which an instrument can be passed.

Though most successful in strictures of recent formation owing to its painlessness, simplicity, safety, and convenience, often the surgeon gives it a trial when the aspect of the case, its great duration, and the density of the tissues entering into it, and other characteristics indi-

cating some of the more severe operations, might tempt him to begin with a section of the urethra. It is, moreover, the practice selected in those cases where, owing to serious disease of the kidneys, a radical cure of the contracted region is neither possible nor its attempt commendable.

Various instruments are used, and it need hardly be insisted upon that, in the absence of retention of urine, catheters should not be employed. Differences of opinion exist as to the preference to be given to soft or solid metal bougies, some surgeons insisting upon the routine employment of one kind to the exclusion of the other. It will be safe to adopt, under ordinary circumstances, the following practice, especially if the operator have not much experience—*i.e.*, to employ soft gum-elastic bougies when the opening is as small say as a No. 5 English, or less, and to always use metal ones for wider strictures.

There is considerable danger in passing small metal instruments, except by the most experienced. Heavy, solid bougies for all sizes of stricture are better in skilled hands than gum-elastic instruments for interrupted dilatation, though it will be safer to begin with the latter in narrow strictures.

The old-fashioned, highly-polished bellied sounds of Sir Henry Thompson are the best. They have a wide curve, and are so tapered that the widest part of the instrument fills the stricture after it has been dilated by the thinner portion as it is gently pressed on toward the bladder. Tortuous strictures cannot be safely treated with rigid instruments until after partial dilatation by pliable ones.

Having placed the patient in the best possible condition of health, and having his bowels cleared out (and a warm bath given in some cases), he is sent to bed for a few hours earlier than usual, and the treatment may be inaugurated. This latter precaution is a wise one if the operator has not had any previous experience of the patient's power of tolerating urethral interference. It will be well to begin the treatment after he has got warmed in bed, and where he can remain until next morning. In this way rigors, etc., may be prevented until the patient gets accustomed to the use of instruments. At subsequent dilatations this will be unnecessary. It will, however, be always necessary to caution the patient against walking or other exercise, and against exposure to chills for some hours after the passage of instruments.

Beginning with an instrument that will just slip through the stricture upon the lightest pressure, the next size is to be gently passed, and sometimes the succeeding size may be manipulated through at the first sitting. Force, in the ordinary sense of the word, is never to be used, and it is better to be content with making gradual headway. The bougies or sounds should be warm and well lubricated with lard, vaseline, carbolized oil, or Lund's lubricating oil. The writer prefers a thick glycerin of borax (1 : 5) for this purpose, and has never been

disappointed with it; it never becomes rancid, and it is always aseptic, and never irritates the urethra.

The length of the intervals between the sittings is to be regulated by the amount of dilatation accomplished, and by the tolerance of the urethra. Every third day until headway is made, then every seventh day is a safe rule. In the case of a stricture which contracts rapidly, it may be safely attacked twice a week.

At the commencement of each sitting it is well to begin with a size smaller than the one last employed at the former sitting. Any irritation of the bladder or urethra should be subdued before commencing or resuming operations.

As the stricture becomes widened, and the larger sizes can be passed, it is an excellent plan to leave the instrument in for ten to twenty minutes before finishing up the sitting; but this practice only excites pain and irritation until the stricture is accustomed by weeks of interrupted dilatation to tolerate the presence of the bougie.

The sittings should be continued until a No. 15 English instrument can be easily passed. To stop at a No. 12 is a mistake, as inevitable shrinkage follows. It is the non-observance of this rule which leads to failure in the hands of most men. Though the stricture cannot be regarded as cured in the great majority of cases, nevertheless, by dilating the urethra up to its fullest capacity, the very best results are obtainable, and in some cases no narrowing may be detected for years.

It is essential, however, that the patient be taught to pass at least a No. 12 English gum elastic bougie every month for three or four months, then every three or six months, returning once a year to have the largest (No. 15) size introduced by the surgeon.

Where the stricture is very narrow at the start, and especially if very tortuous, this plan will sorely tax the operator's patience; and in those cases where it rapidly contracts between the sittings, it may have to be given up. In such cases, the writer, when formerly engaged in surgical practice, made it a rule to start the treatment by continuous dilatation, and afterward resort to the interrupted. This plan succeeds admirably in many bad cases, and by a patient trial of it, cutting operations are seldom required.

By continuous dilatation the operator brings a new element into his treatment, and the continual, steady pressure of the face of the stricture against the retained bougie, soon leads to the establishment of important changes in the inflammatory or cicatricial tissue entering into the formation of the stricture.

The patient is put to bed after a warm bath, and twice a day 10 grains of boric acid are administered after food. This drug is an important branch of the treatment, as it renders the bladder perfectly aseptic, and robs the method of many of its objections. It occurred to the writer to recommend it after observing the changes which often occur in the urine some days after an instrument has been tied in.

So prepared, and every attention to the patient's health and kidneys having been paid, a soft gum-elastic catheter is passed through the stricture, which it must fit loosely. It is tied in and allowed to remain for twenty-four or forty-eight hours, when a larger one is substituted for it. This is again changed at the end of two or three days, and so on until the full size is reached. The bone end of the catheter should be removed and a small plug of wood inserted into the calibre of the instrument. The catheter should be kept free of the neck of the bladder; it may be pushed home as the urine is required to be drawn off every four hours; after this is accomplished, it may be withdrawn for one or two inches, so as not to cause needless irritation to the neck of the bladder. The plug of wood must be carefully inserted each time into the end of the instrument.

This plan as just described is followed by relapse so often that it is now seldom carried out; but if it be discontinued as soon as, say No. 7 can be passed, the treatment then can be carried out by further interrupted dilatations by polished solid metal sounds. Its great value is in starting this treatment in the case of very fine or tortuous strictures, where the passage of small-sized rigid instruments is very dangerous from their liability to form false passages.

The plan of treating strictures by rupture or forcible dilatation is carried out in two ways. An instrument consisting of two blades folded together, so as to take the shape of an ordinary sound, is passed into the urethra through the stricture, when the blades or lateral halves are slowly caused to separate by turning a screw in the handle. The stretching ruptures the stricture, as stricture tissue will not yield to any appreciable extent. The operation is carried out at one sitting, lasting over fifteen to thirty minutes.

A speedier plan is that sometimes known as divulsion, in which a somewhat similar instrument is used, but the force is suddenly applied by thrusting a wedge or rod of metal between the parallel halves of the dilator. The sudden expansion of the blades splits or rips open the fibrous tissue of which the stricture is composed.

Both methods are very dangerous, being liable to be followed by the worst complications, and when immediately successful are generally followed by speedy relapse.

The writer has witnessed the practice of a plan in favor with the old school of surgeons, which, though dangerous and objectionable, nevertheless sometimes gave brilliant results in the treatment of recent soft elastic strictures. He tried it once himself many years ago, and was surprised to find how easy and successful it was. A moderately wide stricture, say one admitting a No. 6 or 5 English solid tapering or bellied sound, is dilated by the next size, and one such instrument after another is passed, the force gradually increasing, though never amounting to anything like strong pressure upon the handle, until a No. 12 is passed at one sitting. The number of strictures to which such heroic treatment would be applicable must be very limited.

Urethrotomy is the operation of cutting through the stricture. This is done internally from the urethra, or externally by cutting down upon it through the skin from without.

Internal urethrotomy is applicable to strictures near to the meatus, to those which contract rapily after dilatation by bougies, to dense cartilaginous or narrow bridle strictures which cannot be dilated without the use of a force being applied which is not safe, and to strictures in patients subject to rigors and urethral fever of a severe type.

A great variety and number of ingenious instruments are used, each operator selecting one which carries out some requirement that he considers essential to success. These may be divided into two classes—*i. e.*, those designed to sever the stricture from before backward, and those which are first passed through the stricture, which is then divided as the instrument is withdrawn, cutting from behind forward.

In very narrow strictures of cartilaginous hardness the former kind of instrument is employed. A filiform guide-bougie is first passed through the stricture into the bladder. Upon this a hollow sound is introduced through the narrowed part, and by means of a shielded blade, guided upon a contrivance attached to the halves of this sound, the narrow stricture is divided to the required depth as the blade is pushed against the stricture toward the bladder, cutting from before backward.

Where the stricture can be dilated to the size of a No. 5 instrument, the urethrotome of Thompson, Civial, or Otis, is passed through it, and as the instrument is withdrawn the concealed blade is caused to incise the narrowed part for its entire length, the depth of the incision and the "tautness" of the parts being regulated by various mechanical contrivances designed for the purpose. The stricture must be divided through its entire depth, but care must be taken to leave intact the healthy vascular or erectile tissue lying external to it. In using Thompson's urethrotome the operator gets great assistance by feeling the resistance of the tissues and the progress of the blade, by grasping the penis from the outside with the fingers of the left hand.

After the operation of cutting, a large solid metal sound (No. 14 English) is put into the urethra, and permitted to find its own way into the bladder by gravitation. This gives a practical proof of the completeness with which the stricture has been divided, and should the sound fail to enter the bladder without pressure a second incision of the parts may be considered advisable. Upon withdrawal of the sound the largest sized metal catheter is inserted, and the bladder very thoroughly emptied of all urine. It is a mistake to attempt to tie in a catheter. The patient is placed in bed, gets a morphine suppository and abstains from drinking liquids, and is kept very warm so as to encourage the action of the skin, while a few bits of ice are used to relieve thirst. In six, eight, or ten hours, when he can hold his urine no longer, he is placed in a hot bath and permitted to micturate. Rigors are to be anticipated by a full opiate, whiskey, and

quinine, and the bowels, which should have been purged before operation, are allowed to remain locked up for the first four days. Harrison always combines external with internal urethrotomy in order to establish thorough drainage of the wound, and thus prevent rigors and sepsis.

The following combination may be used to prevent rigors and fever:

℞.—Quininæ sulphatis gr. vj.
Pulv. ipecac. et opii. gr. xij.
Acidi borici gr. v.—M.
Make six of these powders.

S.—One to be given immediately after the operation, in a tablespoonful of whiskey, and repeated in three hours and again in six hours if necessary.

The following may be given where large doses of quinine cannot be tolerated:

℞.—Morphinæ hydrochlor. gr. j.
Antipyrin. gr. xl.
Cocainæ hydrochlor. gr. vj.
Aquæ chloroformi ad ℥iij.—M.

S.—A dessertspoonful to be taken every two hours in a little water.

Hemorrhage may be troublesome at any time within a week after the operation, and is especially liable to come on after erections if the incision has been too deep. If from the deep portion of the urethra, firm pressure and ice-bag or the crutch of Otis may be used. If from the penile portion of the canal a firm catheter or lithotomy tube may be passed, and a bandage placed around the penis so as to compress the bleeding surface against the instrument until some effort is made at repair.

Extravasation of urine, urethral or septic fever, pyæmia, cystitis, epididymitis, urethritis, or kidney trouble, must be dealt with promptly if they show themselves.

About the seventh day the patient, in a warm bath, should have a well lubricated, soft gum-elastic bougie (No. 12 English) passed through the urethra, and he should be confined to bed until this period. About every three days for the next fortnight will suffice for the passage of the bougie, and at the conclusion of the treatment the patient is taught to do this himself, the after-management being exactly the same as if the operation of interrupted dilatation had been carried out.

Where long-standing bladder troubles cause fetid or ammoniacal urine and pus to trickle over the wound, the operation of draining the bladder by means of a perineal wound is sometimes considered, but the very marked and reliable effects of boric acid when given internally will nearly always do away with this necessity.

In external urethrotomy the stricture is reached from without, and

there are various operations to suit the requirements of the different cases. The cases in which the operation is indicated are those generally associated with urinary fistula and a dense unyielding stricture, and those instances in which a portion of the urethra is practically obliterated by a tortuous narrow stricture, through which it is impossible to get any instrument toward the bladder, and in which internal urethrotomy would be highly dangerous or impossible.

When an instrument can be introduced through the stricture into the bladder, Syme's operation is the one usually selected. A staff, grooved upon the convexity of its curve, which is about the size of a No. 2 English catheter, is passed through the stricture into the bladder. The groove is in the middle of the curve, and this ends abruptly in a broad shoulder which marks the beginning of the anterior portion of the staff, which is about the size of a No. 12 English from the shoulder to the handle. With the patient in the lithotomy position, and the narrow grooved part of the staff through the stricture, the broad shoulder being held against its face, the operator cuts down upon it from without by a median incision, enters the groove with his knife and divides the stricture in its whole extent, after which a catheter is passed upon a probe acting as a guide into the bladder. A fine gorget may be used to incise the urethra in the direction of the bladder. A catheter is tied in for the first three or four days, and a bougie or sound passed every second or third day until the perineal wound heals.

Wheelhouse's method is the one generally selected when it is found impossible to get any guide or instrument into the bladder through the stricture. With the patient in the usual lithotomy position, a staff is passed down to the stricture and held there, the button-like point of the staff bearing down against the face of the narrowed tunnel. A median incision is made down to the staff, and the urethra fully divided for nearly an inch. The edges of the wound in the urethra are held apart by sutures or forceps, and after careful sponging a search is made for the opening of the mouth of the stricture. When this is obtained, a grooved director is passed through it into the bladder, and upon this instrument the tortuous, narrow stricture is divided to its whole extent by a narrow knife or gorget. A large catheter is then passed down the urethra, guided into the incised part, and pushed gently into the bladder, where it is retained, as in Syme's operation.

When it is considered advisable to open the urethra *behind* the stricture, the operation of perineal section is selected in those cases where it is impossible to pass any guide into the bladder.

In the lithotomy position the operator places his finger in the rectum upon the tip of the prostate. A sharp-pointed bistoury is plunged into the middle line of the perineum, half an inch in front of the anus, with its back toward the bowel, and aims at opening the distended urethra at its membranous portion, just at the tip of the prostate. When this has been accomplished, a grooved probe is passed

through the wound into the bladder, and upon this a tapering gorget is guided.

When the bladder has thus been successfully reached, two ways are open for dealing with the stricture—a probe passed into the wound may feel for the posterior opening of the stricture, through which it may be be passed, and which may then be divided from behind forward, or an an instrument may be inserted down the urethra, and its point cut upon until it appears in the wound. When this has been achieved, a large catheter should be passed down the urethra and guided into the bladder, and the most patient dilatation by the passage of sounds must be kept up long after the healing has been established, as such strictures are very prone to contract.

Sometimes it is only possible to effect the entrance into the bladder from behind the stricture without being able to deal with the latter, and it is astonishing to find afterward how easily a narrowing, which had foiled all attempts at catheterization, can be made to yield after a few days' rest following perineal section. Shield successfully sutures the urethral wound after perineal section.

Excision of the strictured portion of the urethra has been tried, but with indifferent results. Recently Wolfler has found that the mucous membrane was reproduced upon a urethra from which he had excised an innodular stricture. He uses the mucous membrane obtained from the "stomach of the frog, the bladder of the rabbit, or from the œsophagus of the pigeon, which are all easily separable from the muscular layer of the animal, and which all adhere in the human subject, and when properly placed retain their vitality."

Electrolysis (3 to 5 milliampères) has been employed for the cure of stricture, but all authorities of weight are agreed in pronouncing it to be unsatisfactory, many regarding it as a failure.

Fort uses linear electrolysis by means of a current of 20 to 40 milliampères, and an instrument constructed like a Maisonneuve's urethrotome. The results are far from satisfactory.

STROPHULUS.

The treatment of this affection should be that of a mild form of lichen in infants. Most authorities regard it as identical with lichen, the treatment of which is given upon page 449.

In the infant the affection generally yields rapidly to improved feeding and aperients, with some mild alkali, as fluid magnesia. Locally, any mild unirritating sedative, like the oxide of zinc, dusted freely over the part, does best.

STRUMA—See Scrofula, page 773.

STY.

In the early stages epilation will generally at once remove the trouble. By plucking out the eyelash, any matter that may have

already formed is thus left free to discharge itself through the minute opening. If matter has not formed, this method may prevent it. A needle dipped in pure carbolic acid may be applied to the spot after the removal of the hair. Nitrate of silver is generally used for this purpose, but it is very painful, and may increase the swelling.

Poultices in the neighborhood of the eye are very unsatisfactory. Hot fomentations are less objectionable. A very weak spirit or carbolic lotion is preferable, though it is not advisable to cover this in with oiled silk. The relationship of the sty to boils gives the indications for general and local remedies, and poultices or any other applications, especially if moist and warm, have a tendency to multiply the the local gatherings of pus, if the retained vapor arising from such applications is not speedily permitted to evaporate. Puncture with the point of a fine narrow-bladed tenotomy knife or cataract needle generally gives immediate relief when matter has formed.

A weak ointment of the yellow oxide of mercury (6 grains to 1 ounce) is the best after-treatment in all cases, and it appears to prevent further formations if properly used.

The following oitment may be used with benefit when the condition threatens to return:

℞.—Cocainæ purif. gr. v.
Hydrarg. oxidi rub. gr. iij.
Vaselini alb. ʒvj.—M.

S.—To be smeared over the margin of the affected lid three times a day.

SUFFOCATION.

The treatment of this condition will depend upon the cause, which must, of course, be immediately removed. Foreign bodies in, or constrictions around, the air-passages call for instant remedying. Tracheotomy may be resorted to where the obstruction is above the larynx and cannot be removed. The various methods of performing artificial respiration are described under the article upon Drowning, page 199.

SUNSTROKE.

Instanct transference to the shade, with removal of outer clothing and all constrictions about the neck, throat, and chest, is the first step. In the pure syncopal or exhaustive variety of insolation this may be all that is necessary, with bathing of the face and hands in cold water in mild cases; but where the symptoms are pronounced the cold douche should be freely used, and in cases of hyperpyrexia life can only be saved by a free use of it. In such cases the patient must be treated upon the spot where he falls by the liberal application of cold water, in the form of douche, or cold affusion, the object being to rapidly reduce the temperature of the body by extracting the heat from it by cold water or ice, as in a case of hyperpyrexia in acute rheumatism.

The temperature should not, however, be permitted to fall too low. A reduction from, say 110° F. to 101° or 102° is better than a reduction to 95° or 90°, as some recommend. If there be evidence of great cardiac failure, stimulants may be required; but they should be used with great caution, and the horizontal position rigidly maintained. If removal in such cases is necessary before the urgent symptoms have subsided, it should be accomplished upon a stretcher.

Where the symptoms continue, and repeated affusion is necessary to keep the temperature from rising, the thermometer should be kept in the rectum, so as to enable the physician to keep the body heat a little above the normal. Artificial respiration may be needed, and nitrite of amyl or chloroform may be used if convulsions occur.

Copious enemata of iced water have occasionally been found useful, and they may be resorted to in conjunction with cold affusion or the cold bath, or used alone where from any reason these cannot be employed.

After the hyperpyrexia has been combated, symptoms are to be treated as they arise. Headache may be relieved by the ice-cap, by sinapisms or blisters behind the ears or over the occipital region or or neck; constipation by smart saline purgatives, and any remaining febrile temperature by small doses of antipyrine, to which digitalis and quinine may be added.

Strong purges and bleeding are seldom indicated, and they may do serious harm. The same remarks apply to opium or hypodermic injections of morphine. In the after-treatment no animal food should be given for days, and absolute rest in bed must be maintained.

Meningitis and other troubles, should they follow, are to be met by appropriate remedies. As recovery is often imperfect, and followed by an irritable condition of the cerebral centres, bromides will be indicated, and in some cases, owing to the increased susceptibility to heat, removal to a cold or temperate climate may be imperative, with avoidance of mental work and all sources of worry for a considerable period. Prolonged muscular exercise is also to be guarded against, and the use of alcohol strictly forbidden.

SUPPRESSION OF URINE.

If this be caused by the degeneration of the kidney, as it sometimes is, in the last stages of renal affection, the proper treatment will be that of Bright's disease, page 75.

If the suppression follows the impaction of a calculus in the ureter, this must be promptly treated by the various measures mentioned upon page 788, under Stone in the Kidney.

When suppression follows the internal use of such agents as cantharides and chlorate of potassium, etc., the measures mentioned under Strangury will be indicated.

When the condition depends upon active congestion of the kidneys,

the result of a sudden exposure of the heated body to a low temperature, the proper treatment will lie in the use of those remedies calculated to restore the equilibrium of the circulation, as hot baths, diaphoretics, warm poultices, sinapisms, or cupping to the loins. Where suppression follows urethral injuries or operations upon the urinary tract, similar measures may be employed. In every case the treatment will resolve itself into a removal or amelioration of the cause. When the anuria fails to respond in a short time, uræmia comes gradually on, and the remedies mentioned in detail under Bright's Disease, upon page 73, will be demanded.

These may be summarized as agents which will hasten elimination of urea and other products by the bowel and skin, as saline cathartics —*i. e.*, sulphate of magnesium in full and oft-repeated doses, the blanket, hot air, vapour or hot water baths, the hot pack, pilocarpine, etc. No reliance whatever is to be placed upon diuretics which may seriously intensify the mischief.

In acute cases, as in active congestion from a chill, alone or associated with pneumonia, or with congestion of the lungs, or acute bronchitis, a free blood-letting, by opening a large vein and making a rapid impression upon the circulation, may save life. In less urgent cases wet cupping over the kidneys is recommended. The writer, however, would advise blood-letting from the arm if the case looks so serious as to at all justify the removal of blood.

SUPPURATION—See **Abscess**, page 12.

SWEATING—See **Perspiration, Excessive**, page 615.

SYCOSIS.

There is great diversity of opinion about the best treatment for this troublesome affection. This to a large degree arises from the different views held as to its pathology. At present the great majority of authorities maintain that the common form of sycosis is not in any sense a parasitic affection; others there are who hold that it depends upon the presence of a microphyte or coccus. The writer, merely from watching closely the clinical features of the disease, has long satisfied himself of the parasitic nature of the common form of sycosis. All are, however, agreed in recognizing a variety of sycosis, which is really a ringworm of the beard or chin, and produced by the spores of trichophyton tonsurans.

The treatment of the common form will be first dealt with. Unna, who maintains that this is owing to cocci, nevertheless states that the greatest success will be obtained by treating it as a furunculosis.

The first points to settle are whether shaving, clipping, or epilation, or allowing the beard to grow is the best practice. The writer advises that if the case be seen early, close shaving of the part should be carried out; if there be much irritation, shaving should not be attempted,

but the hairs should be clipped close with great care and nicety by a sharp-pointed pair of good scissors. If the physician is in doubt as to whether shaving or clipping is the best, better let him lean to the clipping. The hair should never be allowed to grow.

Epilation is much abused, and in the early stages of the disease does harm. It should not be applied to the hairs indiscriminately, if done *en masse* great irritation and no benefit follows. Only those hairs which are showing signs of being loosened in their follicles should be removed, and these should be seized singly in the forceps and removed every day. The first step in the treatment will be the removal of all crusts or scabs before even clipping or epilation can be performed. A starch poultice is undoubtedly the best application for this purpose when it is properly made. Brocq advises that the starch for a poultice be first blended thoroughly with precisely the proper quantity of tepid water to form a paste. Boiling water is poured on to the paste, and the mixture left upon the fire for about one minute, being very briskly stirred to ensure its being thoroughly homogeneous. It may be then spread upon some soft, flexible fabric, and applied to the part. A little boric acid (10 per cent.) added to the dry starch, is a great improvement.

After the removal of the poultice the part may be smeared over freely with lard and oil, and another poultice or a good sponging with hot water may be applied in order to clear away all crusts, after which the hair may be clipped and any loose bristles removed by the forceps. In this way most of the purulent points will be evacuated; any others may be incised with the point of a sharp lancet. The application from which the writer has obtained the most benefit is a carbolic oil (1 : 5 or 6). A little perseverance with this will save the physician from trying the innumerable formulæ which are published for the specific cure of sycosis, many of which are, no doubt, valuable, but all of which are useless unless patiently applied for considerable periods.

Jackson advises the internal administration of $\frac{1}{10}$ grain doses of the sulphide of calcium every one or two hours, and the application of Lassar's paste with salicylic acid. He also advises "curetting," but this should be very seldom resorted to.

Unna in severe cases, applies a carbolic-mercurial, or a resorcin-plaster muslin to be worn constantly, or when night treatment only can be carried out he applies all night a zinc-sulphur salve muslin, epilating every morning, and touching the suppurating follicles individually with a 5 per cent. resorcin spirit, corrosive sublimate, or carbolic acid.

Rosenthal claims that the following ointment acts as a specific in the great majority of cases:

℞.—Acid. tannici ʒjss
Sulphur lact. ʒiij.
Zinci oxidi ʒivss.
Pulv. amyli ʒivss.
Vaselini ℥jss.—M.

The following modification of this is also recommended—tannic acid 23 grains; lactate of sulphur, 48 grains; vaseline, 1 ounce.

Any antiparasitic agent applied in dilute solution will effect a cure. Thus ointments of creasote (1 : 9), eucalyptus (1 : 5), boric acid (1 : 7), salicylic acid(1 : 28), carbolic acid (1 : 19), chrysarobin (1 : 25), iodide of sulphur (1 : 16), tar (5 : 7), sulphur (1 : 5), mercury (1 : 2), ammoniated mercury (1 : 10), calomel (1 : 6), nitrate and oxide of mercury, or ointments containing ichthyol (10 per cent.), oleate of mercury (15 per cent.), resorcin (20 per cent.), pyrogallic acid (10 per cent.).

If, during the use of these agents irritation arise, the ointment should be stopped immediately, and plain zinc ointment or the linimentum calcis, be applied in its stead.

All those who have had much experience in the treatment of the disease insist upon the necessity of constitutional remedies, as cod-liver oil, iron, quinine, and tonics, and the correction of any departure from the standard of health.

In the treatment of the parasitic sycosis the remedies applicable to ringworm of the scalp are indicated. (See under Tinea.) Here, as in the common form of the disease, nothing can be done until, by fomentations and starch poultices, all crusts are removed and irritation subdued. The next step will be clipping of the hairs, and epilation of those evidently diseased or suspected.

The further treatment will consist in the steady and patient application of antiparasitic remedies, as mentioned upon the previous pages. These must, however, be used in more concentrated form, and mild ointments, as lard or almond oil, can be applied occasionally to subdue the irritation which they generally produce.

Chrysarobin is unquestionably the most valuable, but owing to the irritation of the face, and the discoloration following its use, it can be of little service in this affection, Creasote ointment (1 : 9) is an excellent application. The student will almost despair of making a beginning in the treatment of this affection if he ponders over the hosts of formulæ given in the text-books or scattered through the journals, most of which are vaunted as specifics. Success in the practical treatment of this and other allied affections will consist in the physician making himself thoroughly acquainted with the effects of a few good remedies upon the different kinds of skins. By degrees he soon comes to know the strength of the application suitable in each case. A weak ointment of iodide of sulphur is one of the most certain agents we possess, but it is generally worse than useless owing to the careless way in which it is prepared by the chemist. It should not be used for several days after it has been made up. Fifteen or 20 grains to the ounce will be strong enough for sycosis.

Citrine ointment stains the skin less than the iodide of sulphur ointment.

The oleate of mercury (5 per cent.) is a workable and efficient destroyer of the germs which cause the disease.

Greasy preparations are better than watery or spirituous solutions as these latter will not find their way down into the deep parts of the hair follicles where the parasite burrows, and for this reason the ointments should be applied with friction after epilation.

For the other various agents which may be used in this affection see under Tinea.

SYMBLEPHARON,

Or adhesion of the eyelid to the eyeball, exists in so many degrees and in so many forms as to prevent any definite line of operation being applicable as a routine treatment. In minor degrees the condition can be easily dealt with by severing the adhesion or band by scissors. In severer forms, where the adhesive surfaces cover a large extent of the lid, they must be carefully dissected from each other and a transplantation of a small piece of mucous membrane from the lips or labia effected. The conjunctiva of the rabbit has been grafted successfully. Subsequent adhesion of the dissected surfaces may sometimes be prevented by turning the conjunctival flap upon itself and retaining it in this position by sutures.

SYNCOPE.

Though this is but a symptom of some more serious condition requiring active treatment, the first thing to be done is to attend to the symptom without delay. The patient must be placed in the horizontal position, with his head low—a little lower than the level of his body. All constrictions about his neck should be removed without delay, and a current of pure cold air should be allowed to blow over him when possible. If swallowing is for the time impossible a dash of cold water in the face is a powerful reflex stimulant to the heart, and may be safely resorted to. Ammonia, smelling salts, or strong acetic acid to the nostrils, with flapping the hands by a wet cloth, may be tried. Where the attack withstands this, and the patient is still unable to swallow, ether or ammonia (sal volatile, 1 part; water, 5) may be injected hypodermically, or whiskey and water, brandy, wine, or any available stimulant may be injected into the rectum.

As soon as the power of swallowing returns stimulants may be given by the mouth.

In desperate cases ammonia, or ether, or whiskey, may be injected directly into a vein, and electricity—the interrupted current—applied to the phrenic nerve or heart. Nitrite of amyl inhalation may be tried. Where hemorrhage has been the cause of the fainting, sometimes success may follow the rapid elevation of the lower extremities and the application of a rubber bandage to drive the blood which is contained in them toward the heart. Where these measures fail transfusion may be resorted to without delay. Artificial respiration, frictions, electric shocks through the arms, and the application of hot

sinapisms may be tried while the more serious operation of transfusion or intravenous injection of warm, weak, saline solution is being proceeded with. (See under Collapse, page 133.)

SYNOVITIS.

Under Joint Diseases and under Hip- and Knee-joint Diseases the treatment of the chronic forms of this affection is detailed, when the diseased action has eventuated in pulpy degeneration or in more or less disorganization of the joint.

In acute synovitis absolute rest must be secured for the inflamed joint. This may be done in various ways, as by the use of splints, sand-bags, etc. Such appliances, however, are not to interfere with the application of remedies about to be mentioned.

Cold applications, either in the form of evaporating lotions, or, what is much better, ice applied freely around the joint, is the most successful of all treatments. Leeching may be resorted to when the pain and high tension do not rapidly yield to ice-bags applied around the joint. Upon an inflamed knee-joint a dozen or more leeches may be placed, and not only are the local, but sometimes the constitutional symptoms are rapidly relieved thereby. If grateful to the patient, hot fomontations may follow the local blood-letting.

Free saline purgation by sulphate of magnesia, followed by a diaphoretic containing small doses ($\frac{1}{16}$ grain) of tartar emetic, at short intervals, is the best constitutional treatment is sthenic and traumatic cases occurring in the robust.

The following mixture may be administered:

℞.—Magnesii sulphatis ℥ij.
Antimonii et potassii tart. gr. ij.
Tinct. aconiti ♏ v.
Syr. aurantii ℥j.
Aquæ menthæ piperitæ ad ℥xvj.—M.

S.—Two tablespoonfuls to be taken every second hour.

In those instances where a distinct rheumatic element is present large doses of salicylate of sodium should be given; and where gout figures in the causation colchicum may be safely prescribed, with a padding of absorbent wool around the joint, which should then be enveloped in oiled silk.

Opium internally must be given with caution; but when severe pain and high constitutional disturbance are present it cannot be withheld. Fifteen grains of Dover's powder, with 2 grains James's powder, may be given every six or eight hours. In synovitis in syphilitic patients a few full doses of blue mass, followed by a smart saline purge, may be used before putting the patient upon large doses of the iodide of potassium.

Where a large quantity of fluid has been poured out into the joint,

and there is danger of disintegration occurring from the very high tension, no harm can come from aspiration, followed by ice and rest.

As soon as the acute symptoms have subsided prolonged rest may do harm, and if the joint has passed into the chronic stage a reversal of the treatment may be the first and only line of practice followed by relief. If much fluid remain the joint after the subsidence of the pain and local heat, counter-irritants are to be employed. Small blisters may be applied in three or four places over a large joint like the knee, or the actual cautery may be lightly pressed against the skin in a few places. These are also the most important agents to use in the treatment of *subacute* or *chronic* synovitis. Combined with them, massage and friction with stimulating liniments, or painting of the joint with strong iodine, may be tried.

When the fluid resists these measures it may be drawn off by the aspirator, and a soft, pure rubber bandage applied for some days. Indeed, it is sometimes wonderful to observe the rapid effect of a rubber bandage over a distended knee-joint when the aspirator has not been employed. Some cases of hydrops articuli yield to this. In other cases strapping by adhesive plaster spread upon some strong fabric serves the same purpose, provided the plaster be removed and reapplied at short intervals as the swelling diminishes. Scott's dressing or a mild mercurial preparation spread upon lint may be applied to the joint under the strapping. By these means much fluid and even thickening of the synovial membrane may be got rid of by the assistance of passive motion and gentle exercise of the joint and the internal administration of iodide of potassium.

When suppuration occurs in the joint there need be no time lost in the trying of these remedies. The only thing open to the surgeon in such cases is to make at least two free incisions into the joint in the most dependent aspect, wash it out thoroughly by a stream of warm antiseptic solution, and insert a drainage-tube under a liberal supply of antiseptic dressing. The limb should be placed in the most desirable position for ankylosis, though the hope of a movable joint is not to be altogether abandoned.

Excision and the various operative and constitutional measures applicable to very chronic cases which have resisted all the above plans of treatment and gone on into pulpy degeneration are described under Joint Disease.

SYPHILIS.

The treatment of the local sore or chancre will be first considered. Considerable difference of opinion exists as to the proper line of treatment to be adopted. Some authorities maintain that no good whatever can come from any attempt to destroy the poison at its point of entrance into the body, as it has already, by the time the patient comes under notice, been multiplying itself in the blood. Others affirm that local

abortive treatment may be successful. Few, however, will be found to have any faith in the influence of any local abortive treatment when the sore has once shown unmistakable evidence of induration. Yet even here the application of a caustic judiciously applied, as the strong liquor hydrarg. nit. or fuming nitric acid, cannot possibly do any harm and even at this stage of the disease the question narrows itself down into whether the surgeon is to do nothing at all in the way of destroying the sore or whether he is to adopt a line of practice which, though almost certainly useless, is not in any way harmful. As a matter of routine, even at this late stage it may be well to cauterize the surface of the chancre.

When a sore is seen at an earlier stage, before induration appears, the question is different. Hutchinson lays down the law that if the patient be seen at any time within a fortnight after contagion with a non-indurated sore it should be completely destroyed. The shorter the period, the greater the hope of success. The applications just mentioned may be used, but in such cases the excision of the sore by means of the galvano-cautery is the best practice.

After its destruction, or in those cases too far advanced for cauterization, a host of remedies may be employed. Perhaps the best routine agent to use is the black wash, applied on lint and changed frequently. It is, no doubt, inferior to iodoform, which answers every indication perfectly, but owing to its easily recognized and penetrating odor this latter must often be laid aside for the old-fashioned black wash. Where the sore is inside a long prepuce this objection hardly maintains, as there is little chance of its volatilization or the escape of its odor.

Where the sore refuses to heal under this treatment it may be occasionally touched lightly with the nitrate of mercury solution, or if any marked tendency to spread is noticeable the fuming nitric acid should be at once freely resorted to. Phagedena must be met by the agents detailed under Gangrene (Hospital). In every case of chancre the most rigid attention to absolute cleanliness is necessary.

The vast majority of cases heal up under iodoform or black wash. Where there is much moisture about the sore calomel is an excellent remedy when freely dusted over it. Where the sores are placed upon the outside of the penis much trouble may be saved by Bloxam's simple plan of applying a small piece of the U. S. P. emplastrum hydrargyri spread upon wash-leather. In the case of female patients, cleanliness can only be obtained by the constant use of the warm sitz-bath twice a day.

The constitutional treatment at this stage of the disease will embrace everything calculated to improve the general health : a light nutritious diet, abundance of fresh air, moderate amount of work and a fair proportion of exercise, and a total cessation from all indulgence in alcohol in every shape and form. Tobacco may be permitted, but only in moderation, and over-feeding and all excesses must be discountenanced.

It is hardly necessary to state that sexual indulgence must be strictly forbidden.

Mercury is the only reliable drug in syphilis. Where failure follows, it is owing to some error in its administration.

Many points still remain to be proven as to the time, methods of administration, etc., but these are being gradually set at rest by the researches and observations of reliable authorities all over the world. The first real step in advance was made when it was demonstrated that in order to cure syphilis by mercury salivation is unnecessary. This important fact is the keynote to success in the treatment of the disease, and its clear recognition means more than what lies upon the surface. It is not merely because salivation in the old sense of the term is now known to be injurious to the patient, but because of what follows in connection with the action of the drug. This may be briefly stated in these words: When mercury was given in heroic doses with the view of causing salivation as rapidly as possible, the administration of the drug had to be suspended for a very considerable period, and with many physicians was never again resumed in the case; we know now that the best results are only to be obtained by very small doses of the remedy administered uninterruptedly over long periods. Later on the different methods, hypodermic, epidermic, etc., will be detailed.

The first great question to be settled is, should the drug be administered in the primary stage of the disease? Some affirm that it is useless or even injurious. Hutchinson, in his address before the Medical Society of London, published in the *British Medical Journal*, February, 1888, enters into this point most minutely, and his statements should be accepted as settling the question for all time. He says: "The statement which I wish to make quite clear is this: that I believe that it is quite possible by the early and continuous use of mercury to *suppress the secondary stage*—in other words *to make it abortive.* In exceedingly few cases where it has been possible to use mercury without interruption in this way have I known a well characterized secondary eruption or a typical sore throat to occur. In cases where diarrhœa or sudden ptyalism has caused the course to be interrupted the success has been less complete; but where the patient is careful and can bear the drug I may repeat that I believe that it is easily possible to prevent secondary symptoms." Of the truth of this statement the writer is perfectly satisfied by clinical observation, and he accepts the principles of the abortive plan without any reservation as one of the most certain and brilliant advances in therapeutics.

As soon, then, as a patient presents himself with an indurated chancre, he should be placed upon small doses of mercury, as 1 grain of calomel morning and evening, 1 grain hydrarg. cum. creta, in pill, three times a day, or 1 grain blue mass, or $\frac{1}{12}$ grain perchloride twice daily.

The following combination has many advantages:

℞.—Hydrarg. cum. cretæ gr. j.
Quininæ sulph. gr. jss.
Pulv. opii gr. $\frac{1}{6}$.
Ext. quassiæ q. s.—M.

Make 36 of these pills.

S.—One pill to be taken after meals three times a day.

In a fortnight or three weeks the chancre is markedly changed for the better, and the induration is greatly reduced and rapidly disappears as the system gets under the influence of the antidote. This treatment should be steadily persisted in for six or nine months, the gums being watched closely, and the dose diminished upon any marked sponginess or ptyalism. In Aix, where the closest attention is given to every detail that facilitates the admission of the largest amount of the drug into the system without affecting the gums, great care is exercised by the use of tooth powders and astringent mouth washes to keep the gums in a perfectly healthy condition.

The writer has seen many failures in the treatment of syphilis within the last fifteen years, but he has been generally able to trace these to the nervousness of the physician, who was afraid to continue the drug for a sufficiently long period in sufficient doses, or to the carelessness of the patient who ceased to take it. Seldom, if ever, has he chanced to see injury done by overdoses, unless in the hands of quacks or irresponsible persons. He is, therefore, led to conclude that much greater injury is done by withholding the drug than by giving it too generously. When giving mercurials for this long period he often found himself anxious lest the patient might be permanently weakened by the drug, he has never witnessed such a result.

He adopts in these cases a rule of his own which he ventures to hope will become established by the testimony of other observers who will try it. As long as the patient continues to gain in weight, or as long as he steadily keeps to his normal standard of weight, there is little danger to be feared from the action of the drug upon the system. Accurate weighings should be accomplished once a week or once in a fortnight in the physician's study after the patient has been taking the drug for several months. Under this abortive treatment the rash may not appear at all, or if it appears, it is so much modified as not to be easily recognizable. The same may be said of the sore throat and other phenomena. It is, therefore, advisable, if not imperative, that mercury should be given as soon as an indurated chancre comes under notice, without waiting for the appearance of the rash or sore throat. Should mercury be given before induration appears in the sore? In other words, given a sore, which *may* not be syphilitic, are we justified in waiting for changes to take place in it to settle our diagnosis before exhibiting mercury? This question should be easily answered.

Hutchinson thinks that it is possible to cause abortion of the primary stage itself. Whether this is correct or not need not deter the physician

from beginning small doses of mercury when he considers that such treatment cannot possibly do the patient any harm.

The writer adopts the practice of beginning mercurials in every case of sore whose history warrants a fair suspicion of its being syphilitic, but he always gives a small dose, one that in ordinary cases would not be likely to prevent induration of the sore taking place. If full mercurial treatment be commenced under such circumstances, it is more than possible that induration in the chancre might never become marked, and the physician, say at the end of a month or six weeks, would be uncertain, or in absolute ignorance of whether he was treating syphilis or not. Under such circumstances he would not be justified in going on with a six or nine months' course. If syphilitic, however, he probably would find that the secondary symptoms would begin to show themselves soon after the cessation of the mercurial treatment, even at the end of the third or fourth month. By beginning in these doubtful chancres with a very small dose, say 1 grain of calomel every night, and watching closely for induration, upon the first proof of which the dose is to be doubled or trebled, the best thing will be done for the patient. By giving the small doses of mercury before the nature of the affection is declared, the physician will have the satisfaction of feeling that he has the disease well in hand, and upon the appearance of induration he has but to tighten the reins.

Hydrarg. cum creta, 1 grain three times a day, is, perhaps, the most frequently-prescribed dose in this country. The green iodide of mercury, formerly a very favored preparation, is no less frequently employed; it certainly possesses no advantage over calomel or hydrarg. cum creta.

The method of inunction is much in vogue as a routine treatment on the Continent, especially at Aix, where the usual dose is about 38 grains of the German Pharmacopœia ointment (1 : 3), rubbed in twice a day for twenty minutes over the sides of the chest and abdomen and inner aspects of the arms and thighs. These doses would appear to be better borne there than at home. Oleate of mercury or the calomel bath may be substituted. Where the ointment is employed, it must be rubbed into different parts of the body in succession, otherwise local iraitation may supervene. It is not a satisfactory method of administering the drug, except in selected cases, or where the patient gives himself up entirely to treatment, as most of those do who go to Aix. Where a rapid effect is desired, as in cases of neglected syphilis, or where pressing brain symptoms arise in the later forms of the disease, this method may be selected with advantage, or wherever we wish to obtain the full pnysiological action of the drug, or in congenital cases.

The hypodermic injection of the drug in various forms has been exercising the minds of many able men, and when we read of the very small quantity which suffices to effect a cure, one must come to the conclusion that our present methods are crude and open to serious

objections. It is, however, clear that the best form for the administration of the remedy by this route is not yet determined, though progress is being made. In all probability, it may become the method of the future for routine practice. The writer has very limited experience of it. Bloxam, who has injected some thousands of times, justly remarks that it is only by this method that the physician can form any correct idea of the quantity of mercury absorbed into the system. Until recently, he used the intra muscular injection of a solution of corrosive sublimate (8 grains in 1 ounce of water), and the dose was 20 minims once a week into the gluteal region. One thousand nine hundred and twenty-four injections were made. Only one case gave any trouble, and this was where the solution was injected by mistake into the subcutaneous tissue.

Though these results were highly satisfactory, he found that the pain and smarting often lasted two or three days, and he has obtained better results by using a solution of sal alembroth—a double chloride of mercury and ammonium. The following is his formula:

℞.—Hydrarg. chlor. corros. gr. xxxij.
Ammonii chlor. pur. gr. xvj.
Aquæ dest. ad ʒij—M.

This is an absolutely permanent solution, the dose of which is 10 minims—equal to one-third of a grain of mercuric chloride. He states: "So far I have given over 600 injections with this solution, and no untoward effect has been observed. The pain is comparatively slight, the slightest induration following, and the effects most satisfactory, as, after two injections equalling two-thirds of a grain of mercuric chloride, the physiological action of the drug was produced, and could be maintained by an injection once a week, while the symptoms of the disease, both local and constitutional, underwent most rapid and favorable change."

After decided mercurialism has been established, the injections are to be made every fortnight only, and when the glandular and throat symptoms have disappeared, once a month. This is kept up from eighteen to twenty-three months, and the average total quantity of mercury used in Bloxham's cases only amounted to 6 or 8 grains of the bichloride during the entire treatment.

There is still great differences of opinion about the injection of the insoluble salts of mercury, and reports are most contradictory concerning the untoward effects which follow. Galliot has affirmed that he had neither abscesses nor other accident in 4000 injections of 10 centigrammes (1½ grains) of the yellow oxide in 15 grains of vaseline oil. The mercury is detected in the urine in less than twelve hours after the injections, which should be made deeply into the buttock. Other observers confirm these statements, while many report that abscesses and pain have been the rule.

Calomel, oxybenzoate of mercury, and other salts, are used in the same way. "Gray oil" is a favorite form for injection, having been used first by Lang. It consists of a weak lanoline ointment of mercury rubbed up with olive oil, and contains about thirty per cent. of mercury. The dose is 0.2 or 0.3 c.cm. injected into the back.

Leloir uses a third of a syringeful every nine days of gray oil, made by mixing 80 parts of oil of vaseline, 10 of ethereal tincture of benzoin, and 40 of pure mercury. Salicylate of mercury rubbed up with vaseline or mucilage is also highly spoken of.

The various complications or local manifestations which appear during the course of the disease, as a rule, steadily disappear as we push the mercurial treatment, and this is all that is necessary in the vast majority of cases in the secondary stage.

Rarely will it be necessary to inaugurate any special treatment for the skin eruptions. When these occur about the face, so as to make it highly desirable to hasten matters, a mild mercurial ointment, as calomel or white precipitate, 20 grains to 1 ounce lanoline may be used. Where the skin eruption is very formidable the calomel bath may be resorted to, the patient sitting upon a cane-bottomed chair, or with his body in a chamber devised for the purpose. As he receives a vapor bath calomel is sublimed by the heat of the lamp which boils the water, and it is deposited in fine dust over the surface of his skin, after which he lies down in dry blankets. The Turkish bath during the mercurial course is also believed to hasten the disappearance of the rash.

Mucous patches on the throat and mouth, and about the vulva and anus, though they yield in time to the steady use of the internal mercurial, have their disappearance hastened by a light touch of the solution of the nitrate of mercury, and the writer has often applied this to the tonsils. Warts upon the tongue may be similarly treated in these cases, as any form of local irritation will greatly aggravate matters. Smoking must be strictly forbidden. Where the ulcers are deep a little of the powdered iodoform may be blown into them with the insufflator. This substance may be dusted over condylomata, but a mixture of calomel and oxide of zinc answers very well.

All through the mercurial course diarrhœa is to be avoided, and for this reason a small quantity of Dover's powder or laudanum is to be combined with the mercury when any tendency in this direction is observed. When rapid action is desired the patient should be advised to give himself up to the treatment, and either to remain in bed or in a warm room, as free exposure to the air retards the action of the drug, probably by hastening elimination.

The method of continuous dosage (notwithstanding the wide-spread popular belief that mercury makes the patient liable to catch cold) may be safely carried out without any risk following the free exposure of the body to the ordinary variations and vicissitudes of the weather.

At the end of six months of this mild continuous treatment, though the patient may feel and look to be in remarkably good health, if the mercurial be entirely suspended a faint delayed secondary eruption may for the first time show itself in a week or two. The writer has never observed this, as he always insists upon a continuance of the drug for a longer period in a greatly diminished dose. Thus from the fifth to the ninth month, if all has gone on well, one grain of hydrarg. cum creta or one grain of calomel may be all the drugs required each day.

Some physicians make it a rule to stop the treatment entirely for longer or shorter periods, to resume with the dose as before or with a larger dose. This may be necessary when the drug begins to tell at any stage of treatment, but as a rule the best results will be obtained by a steady and continuous administration of the remedy in such doses as are not likely to necessitate pauses.

As already mentioned, the writer's plan of making accurate observations upon the patient's body-weight will assist in this question. It will be wise to suspend the drug for a time when loss of weight is observable.

Tonics may be used in the later months of treatment with great benefit, and in the intervals during the suspension of the mercurial. They are sometimes used in the early stages too freely to the detriment of the patient. Cod-liver oil often comes in well in the late stages in thin subjects. The following may often be used with advantage at this stage:

℞.—Tinct. podophylli (1 : 60) ℥iv.
Tinct. quassiæ ℥ijss.
Tinct. chiratæ ℥jss.—M.

S.—One teaspoonful to be taken three times a day in a little sherry before meals.

Chlorate of potassium is a drug of much use for its local action upon the mucous membrane of the mouth and throat, and when ptyalism occurs it may be resorted to at once as a mouth-wash and gargle (1 : 40). It has no action in the blood upon the disease, as some have thought. The following lotion may be used:

℞.—Potassii chloratis ℥iv.
Glycerini boracis (1 : 5) ℥j.
Aquæ rosæ ℥xv.—M.

S.—To be used as a gargle frequently, and one tablespoonful to be swallowed after meals, three times a day.

In single subjects contemplating marriage the administration of the drug in small doses should be continued up until after the event has been consummated when this occurs inside two years. Marriage

should always be put off for at least two years from the period of contracting the disease. Where this law cannot be carried out the writer makes it a rule to insist upon the absolute necessity for a *mild* mercurial course being followed by the female as soon as conception has been known to occur. He considers this latter point a matter of the gravest importance, and with a little tact it can nearly always be managed without the risk of exciting suspicions which might lead to serious unhappiness.

So much for the treatment of the secondary and intermediate stages. The tertiary manifestations of the disease will require another drug for their destruction. Iodide of potassium has not yet been mentioned. Seldom is it indicated in the secondary period, but occasionally it has been found necessary to give it where the early periostitis of bones cause much pain, and where the ulceration of the throat does not readily yield to mercury. Nevertheless, it is regarded as a drug to be reserved for the treatment of the later or tertiary stage.

The small but continuous doses of mercury, if administered for a long time, very materially diminish the chance of tertiary symptoms. This view is at least held by several, and it is accepted by the writer. It has its influence upon the treatment of the sequelæ in this way—that, given marked tertiary symptoms in a patient who has had little mercury administered to him in his secondary period, this drug will be found to act very rapidly in removing them.

Iodide of potassium is given for every tertiary symptom. Under its use large gummatous tumors melt away, and nodes, which had withstood all other agents, disappear as if by magic. Many affirm that its effects are transitory, and that relapses always occur, and that in no sense is it curative. This is quite true, if its use be not continued long after the apparent removal of the local affection; but there is sufficient clinical evidence to show that in many cases, without the use of any other remedy, the iodide has effected a removal which had become permanent. In dealing with tertiary manifestations, and the effect of iodides upon them, one can be quite satisfied that when they disappear it is not spontaneously, but by the result of the action of the drug, as these affections, if let alone, show no tendency whatever to resolve.

Notwithstanding these considerations, it will be a safe rule for the physician to make for his own practice, that in no case should the action of the iodide be depended upon unless followed immediately before or after, or used in conjunction with, mercury in some form or other.

For the group of symptoms known as "intermediate," the best treatment will be a combination of the iodide with the usual mercurial dose. Under this plan choroiditis, testicular sarcocele, and various early cerebral affections disappear, and the specific action of the iodide seems to increase as the affections become more and more separated from the primary stages, as pointed out by Hutchinson.

Given a case of real and unmistakable tertiary nature, the question will arise, should the iodide be commenced at once without waiting for the action of mercury? This will depend upon various points in the history of the treatment of the case, and also upon the exact locality and gravity of the lesion. Where mercurial treatment had not been patiently carried out in the secondary stage, the best results are to be expected from it. It is in these cases that the Aix method, or the vaseline oil and yellow oxide of mercury injections, do so well, even after the failure of the drug by the mouth.

If, then, the tertiary lesion resists mercury, or if it appears, say, in the form of a cerebral tumor, the iodide should be commenced at once. As a rule, it is useless to begin with small doses. The writer has never observed that the best effects may be noticed from small doses. Hutchinson states that he has known patients cured in the most definite manner by doses of less than a single grain, and he also remarks that the most severe untoward effects have followed very small doses.

The writer's plan is to begin with 5 grains three times a day, and gradually increase until 20 grains are taken in each dose. It is a very remarkable fact, about which there cannot be a shadow of doubt, that the irritation and troubles following small doses, say 2 grains of the iodide, speedily disappear upon doubling or trebling the dose. Idiosyncrasy is not affected in this manner.

It is not an uncommon experience to find a patient who has taken fair doses of the iodide for many months for nodes without the least result. If the dose be suddenly increased, say to 20 or 30 grains, the nodes begin to disappear as if by magic.

The American system of giving ½ ounce doses is not to be recommended. One drachm in the day meets the requirements of the great majority of cases, and, as just mentioned, it is remarkable how soon all coryza and other unpleasant symptoms disappear when full doses are given. Wood lays down the law that where such doses as these are tolerated, it amounts to a proof that the disease under treatment is syphilitic, so satisfied is he of the great toleration of the drug which this disease establishes.

One very important therapeutic law may be formulated about which there can be little question—*i. e.*, that in tertiary syphilis the local action of mercury and iodides is incomparably greater than in the secondary lesions, and just in proportion to the remoteness of the tertiary affection from the secondary, so does the importance of local treatment increase. This is demonstrated in cases of rupia, serpiginous ulcerations, lupoid growths, and ozæna, where iodoform or mercurial applications act like magic after failure of internal treatment with both iodides and mercury.

The choice of local applications will lie, in the majority of cases, between the acid nitrate of mercury solution and iodoform applied in powder freely or as a strong ointment. The internal administration

of iodides or mercury must be persevered with at the same time, but oftener mercury is found to disagree with tertiary patients than with those suffering from the primary or secondary stages of the disease. It is in such cases that the calomel bath, injections, or inunction do so well when the drug by the mouth appears to fail.

Various forms for administering mercury and iodine together in tertiary syphilis are used. The biniodide of mercury in the form of pills, each containing $\frac{1}{32}$ to $\frac{1}{16}$ grain, is very effective.

Donovan's solution has long maintained its reputation, and the U. S. P. formula (containing 1 in 100) may be given for long periods in doses of 20 minims. Perhaps the best of all combinations is corrosive sublimate, prescribed in iodide of potassium solution. Its great advantage lies in the facility with which the iodide or the mercury can be increased or diminished at pleasure, according to the effects required:

℞.—Hydrarg. chlor. corros. gr. jss.
Potassii iodidi ʒiij.
Aquæ dest. ℥xij.—M.

S.—Half an ounce in a little water, to be taken three times a day.

This mixture may be given for a month at a time, when the mercury may be stopped, the iodide being administered without it. At the end of the second month the mercury can be added, and so on each alternate month. Tannate of mercury is recommended in tertiary syphilis in doses of 1 grain twice or three times a day, but it has no advantages over other preparations.

Where large doses of the iodide are to be continued for long periods, the iodide of sodium should be selected, as it has a less depressing effect. Some authorities advise the use of a combination of the iodides of sodium, potassium, and ammonium. Quinquaud has recently advocated the treatment of syphilis by mercury employed in the form of a plaster, applied over the spleen every eight days. His plaster is composed of diachylon plaster, 3000 parts; sublimed calomel, 1000 parts; and castor oil, 300 parts, spread upon leather four inches square. If salivation be desired, the size of the plaster is to be doubled.

Szadek has been employing iodol in tertiary syphilis with success, and its use may be a distinct gain in a certain class of cases, where a slower and more continuous effect is required than that of the iodide of sodium or potassium. Its action is identical with these salts, but it is more slowly eliminated. He gives it in 15 grain doses in powder enclosed in unleavened bread. It may be applied locally, and, though less efficacious than iodoform, it is devoid of its disgusting odor.

When *very large* doses of the iodides are considered necessary, it is well to stop the administration of mercurials for a time, and it appears probable that a small proportion of arsenic diminishes the tendency to skin eruptions.

The following combination may be used:

℞.—Sodii iod. ℥iv.
Potassii iod. ℥jss.
Ammonii iod. ℥jss.
Liq. potass. arsenit. ℥ij.
Tinct. aurantii amar. ℥ij.
Glycerin. purif. ℥j.
Infusi calumbæ ad ℥xx.—M.

S.—One tablespoonful to be taken three times a day, after meals, in water.

The iodide treatment may require, in some cases, a longer period than the original mercurial course. Some patients may be kept upon it, with occasional breaks, for two years. It must be persisted in until every trace of the local affection has long disappeared. It is hardly necessary to emphasize the necessity for close attention to the state of the general health in tertiary syphilis. Change of air to the seaside and a long sea voyage may be necessary in tedious cases.

Congenital syphilis must be treated upon the same general principles as in the ordinary acquired variety. Success is likely to crown the efforts of the physician in the most unpromising cases. Failure is too often caused by timidity in pushing mercury. It must be borne in mind that children bear large doses of the drug safely, and the writer elsewhere (*Pharmacy, Materia Medica, and Therapeutics*, fifth edition) has pointed out that it is almost impossible to do harm with hydrarg. cum creta to infants poisoned by syphilis, as long as their tissues are saturated with the syphilitic virus, as this latter acts as a vital antidote to the mercury. When the disease is destroyed by the drug, the child begins to show signs of not tolerating it so well. Salivation is almost impossible, and it may be laid down as a safe rule that it may be pushed as long as the child continues to thrive.

For an infant six months old ½ to ¾ grain of hydrarg. cum creta may be given three times a day for several days. Then the same dose once a day may be continued for many weeks. If the physician have doubts about pushing it further, he should make careful weighings of the patient, and any steady diminution of weight will be a strong indication that the treatment should be suspended.

The writer is satisfied of the truth of the following statement that he made some years ago: "Weak, emaciated infants bear larger doses when poisoned with syphilis than they can when afterward apparently cured and fattened; but if, after a period of neglect, syphilitic symptoms come on markedly, then they bear very large doses again."

The old-fashioned method of smearing weak mercurial ointment upon a flannel roller wound round the abdomen is a very good one. The movements of the body rub in the drug as in the ordinary operation of inunction, but the physician has no guide to the amount absorbed. The writer has had excellent results by using a roller satu-

rated with cod-liver oil, to which a small quantity of the ointment had been added. Over this a broad binder of makintosh is applied, and the oil renewed every morning or evening without changing the roller. Marked increase of weight always follows this simple but invaluable plan.

The mercurial may be suspended from time to time, but should not be discontinued for at least one year.

Cod-liver oil and syrup of iodide of iron, to which a small quantity of iodide of potassium has been added, should be given at various opportunities during the course.

The milk of the child's mother may be given to it with advantage if she be also put upon a mild mercurial course at the same time, and in very mild cases this treatment may possibly be sufficient. It is, of course, out of the question to put the child to the breasts of a healthy wet-nurse owing to the danger of infecting her through the nipples. If hand-feeding must be adopted, unusual care will have to be taken during the first six or nine months, and beef juice should be given at least once a day. The milk of the ass is said to do well in such cases.

TABES DORSALIS—See under Locomotor Ataxia, page 456.

TABES MESENTERICA—See under Mesenteric Glands, page 507, **and under Scrofula,** page 773.

TALIPES—See under Club-foot, page 129.

TAPEWORM.

A very large number of drugs are known to act as poisons to this parasite when administered in the ordinary way to the patient in whose intestines it has taken up its abode. Every year brings out new agents for this purpose, but in spite of the great activity in this department of therapeutics, the oleoresin of aspidium still maintains its supremacy as being the most reliable of all vermifuges. By care in its administration, and by a knowledge of the way in which it acts, the physician will very seldom have to resort to any other agent. Its only drawbacks are its very nauseous taste and its liability to upset the stomach, but these objections can be overcome by improved pharmacy.

It is efficacious against the tænia solium and bothriocephalus, but it must be given in larger doses than those usually prescribed. The dose of 15 to 30 minims is useless. Less than one drachm is generally of no value. Some authorities recommend a dose of 4 drachms, and J. O. de Man publishes a list of twenty-eight cases recently where the dose was from 2 to 9 drachms, the average dose being about 6 drachms.

This dose would probably be generally fatal if the oleoresin was of good quality. The male fern is of varying activity, according to the soil and climate in which it has been grown, and the only way to reconcile the doses of Man is to assume that he had an inferior extract.

Potain has pointed out that certain parts of Normandy, for example, produce male fern which has no effect. The writer thinks that the various discrepancies regarding the dosage may also to a large extent be explained by the difficulty in distinguishing the fronds and rhizomes of *aspidium filix-mas*, *asplenium filix-fœmina*, and others; the filix-mas exhibits eight fibro-vascular bundles on a transverse section of the petiole base. The identity of the fern should be carefully made out before the oleoresin is prepared, and the physician should be very particular about the pharmacist to whom the dispensing of this drug is entrusted. Of an active oleoresin four drachms has several times caused death. One drachm is, however, a fair average safe dose.

Several precautions are necessary in order to make the attack upon a tapeworm a success, and these maintain in the case of all other vermifuges or vermicides. Thus, the alimentary canal must be as empty as possible, so as to permit the drug to exercise its undiluted effect upon the parasite. For this reason these drugs should be given after a long fast, or better still, after a brisk saline cathartic. Then, as many of these agents simply act by killing the worm, a purgative should be given soon after or along with the vermicide. The worm must be very closely examined to ensure its complete expulsion. Very often only a large number of "joints" are passed, and the head is left behind. Failure, then, of course results, as the head goes on growing, and the dose should be repeated in such a case after a day or two of rest.

There may be more than one worm—an event much more frequent than is usually supposed, and only a very close scrutiny of the detached portions will enable the physician to be sure of this. The writer has seen this condition of matters twice.

Given, then, a case of tænia solium, the physician should give about 4 or 6 drachms of sulphate of magnesia in a bottle of lemonade late at night, or very early in the morning by daybreak. A few hours after purgation a dose of not less than 1 drachm (in strong subjects 90 minims) of the oleoresin of male fern is to be administered. This should be followed in a couple of hours by a full dose, 6 to 8 drachms of castor oil, alone or combined with half a drachm of the spirit of turpentine. The worm is speedily expelled dead, and the patient should be warned to gently wash it and look out for its head.

There is, as already mentioned, much difficulty in administering the drug. The following is a good working formula:

℞.—Oleoresinæ aspidii ℥j
Ovi vitellum.
Aquæ menth. pip. et syr. simp. . . q. s. ad ℥ij.—M.
S.—To be taken in the morning.

Many advise turpentine to be added to this draught, and some put in 5 grains of calomel, while others insist upon combining small quan-

tities of every vermicide with which they are acquainted. This latter practice is to be condemned, and so is the calomel, which is too slow in its action, but the turpentine seems to do good.

Ether and chloroform are sometimes combined with the male fern with the view of increasing its effect and preventing griping. The simpler the form in which the drug is administered the better.

Now and then a patient presents himself who cannot possibly keep down a draught such as the above. The best thing to do in such a case is to get a known and reliable chemist to send a good sample of the oleoresin to a capsule maker, and have it *freshly* made into capsules containing 10 or 15 minims in each. Six or four of these quietly swallowed during fasting may glide through the stomach, and as they rapidly dissolve in the intestine they exercise their lethal action upon the parasite.

It is not a bad plan to give a small dose of laudanum, brandy, antipyrine, or other sedative, such as peppermint, along with the subsequent draught of castor oil, to prevent griping and irregular contractions of the bowel, which might tend to break off the worm at the neck. There may be no grounds for such a belief, but such a plan can do no harm.

Duchesne advises the following made into a firm jelly, which can be easily taken by children:

℞.—Oleoresinæ aspidii	ʒj.
Hydrarg. chlor. mit.	gr. vj.
Sacch. alb.	ʒij.
Gelatin.	q.s.

This quantity would certainly be too much for a very young child. A boy five or six years old might take the half of it.

Rothe recommends that chloral hydrate (believed to be a vermicide by some) should be combined with the male fern in combination with a smart cathartic in the form of a capsule, the whole given together, thus avoiding subsequent pain and the administration of a purgative. His formula is: Chloral, 18 grains; oleoresin of male fern, 30 grains; croton oil, 1 or 2 drops. This is a severe dose, though he says it prevents pain and griping, and acts inside of three hours.

Whatever the form in which male fern is given it should only be prescribed in two doses at the most, one to be taken the morning following, or, perhaps, within four or six hours after the first dose. The plan of ordering several doses in a mixture to be taken continuously after short intervals is apt to lead to severe intestinal inflammation, and may cause death.

The following brief summary of our chief anthelmintic agents may be useful for reference when male fern fails:

Turpentine has long enjoyed the reputation of being a valuable agent in killing tape-worm, but to be of any use it must be given in doses

of at least 4 fluidrachms. This quantity often excites strangury and serious symptoms. Moreover, it is most objectionable as to taste and smell, and now it is seldom employed for these reasons. If selected after the failure of male fern, it should always be given with about 1 fluidounce of castor oil after fasting. The parasite is expelled dead; and it also affects the round worm.

Kousso should be given in doses of 4 drachms infused in boiling water, which is swallowed without straining as soon as the infusion is cold. This dose generally not only kills the worm, but causes its expulsion in fragments without any further purgative. Merck has isolated the active principle, koussin, which may be given in capsules in doses of about 40 grains. Bedall's koussin may also be given in the same form, and in similar doses. Wafer paper answers all requirements, and the preparations are more certain than the crude drug, which is much valued in Abyssinia.

Kamala acts in the same manner as kousso; 2 drachms kill and generally expel the worm when given (after a long fast) suspended in syrup, mucilage, or gruel. Anderson's tincture is made by macerating 9 ounces of kamala in 21 ounces strong alcohol, the dose of which is a large teaspoonful. Large doses may purge very severely.

Pomegranate (the bark or rind of the root) is one of the most certain vermicides we possess. Many prefer it to the male fern. It may be administered in the ordinary decoction (2 ounces to 20 ounces). Of this 5 ounces may be swallowed every hour for three doses after fasting.

A great advance has been made in the therapeutics of this class of remedies by the isolation of the active principle of the pomegranate by Tanret, who extracted a liquid alkaloid, which he calls pelletierine. The tannate of this alkaloid is the best form for administration. It may be given in 2 grain doses.

It is said to be safe in doses of 1 grain for children. Its efficacy is said to be increased markedly by a 10 grain dose of tannin given immediately before it.

Schröder has demonstrated that the one ten-thousandth part of this substance, when added to the fluid in which a living tapeworm is placed outside the body, causes its death in a few minutes.

It should be given fasting. As we learn more about the preparation and action of this remedy, it is likely that it may entirely replace the male fern. At present, though the reports are glowing, there is some confusion about the dose, and profound muscular weakness has resulted from 5 or 6 grains, though some authorities, among whom is Boas, advise four times this amount.

Most of the discrepancies regarding the dose of the root bark are to be explained by the rapid deterioration of the specimens on being kept for any time.

Pepo—the seeds of the common yellow pumpkin—are found to be harmless and often efficient, and, upon the whole, in the present state

of our knowledge, they are the best agent for children. A large teaspoonful of them may be pounded into an electuary, with sugar, and given to a fasting child, a purge following in three or four hours. Wood gives the adult dose as 2 ounces. The greenish resin obtained from the perisperm may be given in 10 to 20 grain doses.

Embelia ribes seeds, given in similar dose and form as in the case of the latter drug, is a favorite East Indian remedy.

Areca nuts are just at present highly vaunted. They have been long prized in veterinary practice. One to 6 drachms have been frequently given. The proper dose is, perhaps, about 2 drachms, given in milk after a long fast, and followed by a very brisk purge. The active principle is a liquid alkaloid resembling pelletierine, to which the name of arecaline has been given. It has an action resembling muscarin.

Cocoanut has certainly some action, but the milk and the albumin of an entire nut must be taken to produce any effect. It may be given safely to children.

Ether and chloroform, and, more recently, the hydrate of chloral, have been used with considerable success in full doses, with the view of poisoning the worm, which is then to be expelled by a very strong drastic. The writer, if compelled to use the first two drugs, would combine them with a *large* dose of castor oil, and in the same way the chloral might be given with 1 to 2 drops of croton oil. Rothe gives chloral and male fern together in the capsular form, as previously mentioned.

Thymol in large doses has been recently recommended. Gampi has given 2 drachms, followed by 5 drachms of olive oil. This dose might easily prove fatal. The writer has observed great irritation follow a large warm-water enema containing only a few grains of this substance.

Myrtol, in doses of 2 grains in capsules, has been recommended.

Menthol would, no doubt, also act like thymol.

Naphthalin, the intestinal disinfectant, has been tried successfully for tapeworm. Five grains may be given in wafer paper.

Balsam of copaiba (4 drachms), salicylic acid (45 grains), have been tried successfully in a few cases.

No mention need be made of the old mechanical remedies intended to dislodge the worm from its moorings by irritating it, as powdered tin, iron filings, zinc, charcoal, mucuna, etc. Many, if not all, of the strong drastics occasionally act as vermifuges by wrenching the parasite from its position in the bowel.

TEETHING—See Dentition, page 173.

TENESMUS.

The treatment of this symptom will depend upon the cause, the removal of which must be carried out before relief can be obtained.

Until the remedying of the cause is effected, some ease may be obtained by local anodynes, as morphine suppositories, small enemata of laudanum (40 minims in 2 ounces starch-water), enemata of ice water, or injections of large quantities of very warm water. The writer's unguentum conii, now official, is very valuable in some cases.

(See under Proctitis, Hæmorrhoids, Anus, Fissure of, etc.)

Tenesmus of the bladder will be relieved by the agents mentioned under Bladder Affections, Stone in the Bladder, etc.

TESTICLE, Diseases of—See under Hæmatocele, Varicocele, Hydrocele, Cancer, Scrofula, etc.

TESTICLE, Inflammation of—See Orchitis, page 557.

TETANUS.

Owing to the great diversity that exists in the severity of the cases, the exact value of drugs in this disease is open to serious differences of opinion. There are some pessimists who believe that the cases which recover would have got well without drugs at all. Anyone who studies the clinical aspects of the disease cannot fail to observe how near to a fatal issue are some of the cases which recover, and how near to recovery seem some of those chronic examples of the disease which end fatally. It is obvious that a very little may turn the scale in either way, and the value of good nursing and certain drugs should be regarded as beyond a doubt.

The patient should be put to bed upon a good mattress, in a dark, quiet room, to which only the physician, nurses, and one or two of his most intimate friends are allowed access. Cotton wool is placed in his ears to keep out sounds, a thick carpet being spread upon the floor.

Renzi insists that the physician should grope his way about the room with a dark-lantern. The importance of absolute stillness is doubtless very great, and the patient should only be permitted to speak when absolute necessity dictates. By these precautions, the authority just mentioned claims to have cured three out of four cases.

Feeding is of much importance. Liquid nutritious foods are to be poured into the mouth. Stimulants are indicated in full doses in the majority of cases, and where swallowing is impossible or very difficult, rectal feeding by strong, peptonized broths may be resorted to. As this often proves unsatisfactory, Rose's method of giving chloroform twice a day may be resorted to, and when complete anæsthesia has been obtained, the stomach may be filled through a rubber tube with nutritious liquid food.

Constipation may be left alone, as purgatives do a great deal more harm than good, and cold or warm baths are to be condemned owing to the difficulty in administering them.

Any wound or injury is to be carefully examined or explored, and, by the removal of any foreign body or retained secretion, all sources

of peripheral irritation are to be avoided. Soothing or anodyne dressings are necessary, and rigid antiseptic precautions should be maintained.

Some authorities make linear incisions into the neighborhood of the wound, and then apply caustics. This is to be condemned. Nerve stretching and nerve section, nerve freezing and even amputation have been tried, and in a few isolated cases have received the credit of the recovery, but such measures cannot be seriously considered except under very rare circumstances. Ice-bags to the spine have not given any marked benefits to warrant their routine employment; and the same may be said of electricity, which, indeed, may do great harm.

Of drugs there is practically no end, every known sedative having been at some time or other tried, and supposed to have turned the tide against the microbe. It is certain that we are unaware of any agent possessing a specific or curative effect in severe cases; but, as already mentioned, several drugs may be used to keep the patient alive until the disease exhausts itself by elimination, and in the very worst cases relief of suffering may be obtained.

Bromide of potassium in full doses generally somewhat diminishes the spasms, and a few mild chronic cases have been reported as cured under its influence, but it need not be relied upon where the symptoms are severe, unless it be given in combination with the next drug.

Chloral hydrate has been used in many cases which have recovered, and there are good grounds for believing that it may occasionally save life. It must be pushed until the full physiological effects are observed, 30 grain doses being given every three hours, or 15 grains every hour or every second hour until some impression is made upon the symptoms.

The following mixture may be tried in a severe case in the adult:

℞.—Chloral ℥ij.
Potass. brom. ℥j.
Tinct. opii ℥iv.
Spt. chloroformi ℥ij.
Aquæ camph. ad ℨviij.—M.

S.—One ounce to be given with an equal quantity of brandy every hour.

In prescribing narcotics in this disease, it must be borne in mind that enormous doses may be given.

Opium by mouth, or morphine hypodermically, may be pushed with less danger than chloral, whose depressing influence upon the heart may make itself felt before drowsiness appears. These drugs should be given in proportion to the spasm and pain, no attention being paid to the amount of the dose; 4 to 6 or even 8 drachms of solid opium have been tolerated in twenty-four hours without injury. Some physicians combine chloral and opium. Cannabis indica may be pushed like opium—it is often given with chloral.

Alcohol in *very large* doses, tobacco in nauseating doses, nicotine, and tartar emetic may be pushed until sickness comes on. Apomorphine, lobelia, and other depressants have been tried, and in a limited number of cases appear to have done some good. Of the series, alcohol is the safest—most of them are dangerous. It will be obvious in selecting a remedy in this disease that it is better to use one which can be pushed until unmistakable physiological symptoms appear and give warning when to stop. Nicotine possesses the advantage of being easily given by hypodermic injection.

Chloroform or ether affords the only relief in very acute cases coming on soon after the wound has been inflicted. In this group of cases anæsthesia may be kept up for many hours at a time, and it may be pushed even when death is evidently approaching, as the only possible way of relieving suffering.

Calabar bean has been frequently tried, and it certainly has appeared to do some good. At one time it was believed that a specific for tetanus had been discovered in this drug, but it has failed so frequently that its reputation is upon a par with the previously mentioned agents. One grain of the extract has been given every half-hour for eight or ten doses in bad cases. It generally has little effect upon the spasms until dangerous collapse appears, with a fall in the temperature.

Curare, after a fair trial, has likewise lost ground, and though now and then cases are reported which seem to show that it has done good, just as often are these set aside by complete failures. One-fourth grain of the drug may be injected in 10 minims of water every hour for several doses, then every two hours. It is not a drug to be relied upon.

Pilocarpine, in $\frac{1}{4}$ grain doses hypodermically, has certainly given good results in a few cases, and may be tried when other agents have failed.

Antipyrine and antifebrin have already received the credit of a few successes, and cocaine has been recommended upon the result of its action in a few doubtful cases.

Atropine injected into the muscles, or belladonna and hyoscyamus, gelsemium and conium by the mouth, in doses sufficient to produce toxic symptoms, have been recommended.

Nitrite of amyl and nitro-glycerin occasionaly appear to give some relief, according to several reports.

Quinine in large doses (1 drachm to 2 drachms) has been several times reported as successful.

Strychnine has been given in chronic cases. Its utility is very doubtful. It might, however, be combined with chloral to minimize the dangerous depressing influence of that drug upon the heart.

Now that the microbic origin of the disease may be regarded as settled, we may from henceforth expect torrents of suggestions for the administration of every conceivable antiparasitic agent. Already salicylates and bichloride of mercury are being tried.

It will thus be observed that, as far as drugs are concerned, the

treatment of this formidable malady cannot be said to be in a satisfactory state. Given a very virulent case, the best relief will be obtained by narcotizing the patient with chloroform; and in ordinary examples of the disease, in the writer's opinion, the best line to proceed upon is absolute rest, the strictest quietness, almost total darkness, full doses (1 to 2 ounces) of whiskey, and for medical aids chloral and bromides, which should be pushed to the extent of giving eight or ten hours' sleep. The great danger in the use of our therapeutic agents lies in the temptation of flying from one drug to another, instead of pushing some particular one.

Tetanus or trismus neonatorum may be regarded as the same affection as tetanus in the adult, and must be met by the same remedies. Chloral is the only drug to be depended upon, and the writer has satisfied himself about the great value of it when steadily pushed in the case of infants. One grain may be given by the mouth or by the bowel every hour. The utmost cleanliness in the dressing of the stump of the umbilical cord must be attended to, as this affection is liable to spread among newborn infants.

Soltman recommends ½ grain of musk every three hours when hourly doses of chloral for twenty-four times have failed. Morphine, calabar bean, curare, and the other potent agents should not be thought of.

TETANY.

The treatment of this rare condition is in the same unsatisfactory state as its pathology. In the present state of our knowledge or ignorance, the best agent appears to be the bromides in full doses. Few authorities now endorse Trousseau's heroic plan of bleeding and cupping. The local application of chloroform alone or with aconite or liniment of belladonna is worth trying.

Hyoscyamus or hyoscine hypodermically may be tried.

Chloral, except so insure sleep, should not be employed, owing to the chronic nature of the ailment in some cases.

The general health of the patient should be seen to, and quinine, iron, cod-liver oil, and arsenic may effect results after all the antispasmodic agents mentioned under tetanus have failed.

THORACIC ANEURISM—See under Aneurism, page 41.

THREAD-WORM.

The destruction of these parasites is often a most difficult and tedious process, especially in the adult. There are still several points in their life history which require clearing up before we can be very certain of the best way to get rid of them. It is, however, certain that their ova, getting about the finger-nails, may find an entrance into the body again. Absolute cleanliness is, therefore, an essential. It is also highly probable that as they wander about the anus and vagina they may be

communicated from one person to another sleeping in the same bed. Their origin in the human subject arises from eating uncooked vegetables and fruits, and from drinking water containing their ova. They chiefly infest the lower end of the great intestine, but Cobbold insists that their presence here is accidental, their real locality being as high up as the cæcum.

All these points are of great importance as regards their treatment, especially their "locality," but in this later point many authorities do not agree with Cobbold. It is still believed to be possible to reach the worm and cause its destruction by enamata, which, of course, could hardly be possible if the cæcum was to be reached in every case.

The symptoms caused by the presence of these pests can generally be speedily relieved by enemata containing a large spoonful of chloride of sodium in a tumblerful of water. Lime-water, infusion of quassia, solutions of alum, of aloes, of ether (in water), of eucalyptus oil, of tincture of iron, of weak carbolic acid, of turpentine, of vinegar, of tansy, of olive oil, of chloride of ammonium, and many other substances are very useful, and, in the case of children, are generally successful after a few repetitions of the enema.

A little mercurial ointment just placed within the sphincter keeps them from migrating at night.

Cobbold attaches most importance to internal remedies, and he advises iron in tonic doses, with aloes and asafœtida occasionally, followed by repeated saline cathartics, as the Friedrichshall and Hunyadi waters. Others recommend large draughts of quassia or gentian in infusion, swallowed fasting, and followed by a saline.

Santonin has been given with success.

The writer has always succeeded with salt and water enemata, and in troublesome cases with the internal administration of a course of iron and arsenic, giving an occasional purge of scammony and calomel.

THROAT, SORE.

The treatment of this affection, which is known under various names, as sore-throat, ulcerated sore-throat, hospital sore-throat, follicular tonsillitis, etc., is simple. The constitutional symptoms, which may be very severe in some cases, demand attention even before local treatment. Of the various drugs none act so satisfactorily as antipyrine. The backache and headache and high temperature speedily subside under a few 10 grain doses of this drug. Salol in drachm doses and salicylate of sodium give relief also, but the writer finds nothing so good as the antipyrine, and he has had the personal experience of many attacks. Where this drug cannot be tolerated (which is seldom), the plan of small doses ($\frac{1}{2}$ minim) of tincture of aconite every fifteen or thirty minutes for eight or ten times is very valuable. Veratrum viride acts in the same way. These drugs may be combined with mindererus spirit and nitrous ether. Quinine in full doses, 10 grains immediately, and 5 grains every hour for two or three times, an emetic

dose of ipecacuanha, cimicifuga, large doses of guaiacum, a full saline purge, have all proved efficacious in relieving or cutting short the early symptoms.

A milk diet with strong soups, and, in debilitated subjects, a liberal allowance of port, claret, or a weak milk punch may be ordered. Abundance of pure air and good ventilation are as essential to the patient as they are to those coming in contact with him, for the disease is highly infectious, and easily spread through sewer gas and polluted water. Locally the best gargle is the following:

℞.—Cocainæ hydrochlor. gr. viij.
Glycerini ʒiv.
Acidi carbolici ʒj.
Aquæ rosæ ad ℥xij.—M.

This may be used as a spray or gargle alternately when diluted with an equal quantity of water. It is the best treatment in children when sprayed over the throat every half-hour.

Insufflations of powdered bicarbonate of sodium every fifteen minutes are said to sometimes abort the disease.

Cold compresses, warm poultices, or iced cloths to the outside of the throat may be employed, the selection of each being made upon the report of the sensations of the patient.

Painting the tonsils and pharynx over with a strong solution of nitrate of silver (ʒj to ʒx) occasionally cuts short the attack, and is reported to give speedy relief. It far more frequently aggravates the suffering, and does no manner of good, and, as a *routine* remedy, should not be employed in the early stage of the affection.

At a later stage it very often does great good. When the dysphagia is very severe no remedy gives the relief which may be obtained by a good steaming over boiling water, but the various inhalers, when used for this purpose, are worthless. A large basin of boiling, or very hot, water should be placed in the bed beside the patient's head, and a linen sheet thrown loosely over all, so as to make a tent, is the best way to utilize the hot vapor.

At a later stage alterative or astringent gargles may be used, and these can also be employed as sprays.

The following formulæ may be tried:

℞.—Potassii chloratis ℥ss.
Aquæ dest. ℥xx.—M.

S.—To be used as a gargle or spray every two hours.

It is a common mistake to persist too long in the use of this drug, as it may keep up the irritation.

℞.—Acidi borici ʒj.
Acidi carbolici ʒj.
Infusi rosæ ℥xij.—M.

The great advantage in carbolic acid lies in its power of paralyzing the palatal muscles and preventing the painful and useless attempts at swallowing the saliva and mucus, acting also as it does as a local anæsthetic. The lozenges may be slowly sucked in the mouth instead of using the drug as a spray or gargle.

Balls of nitre, pieces of guaiacum resin, compressed tablets of chlorate of potassium and cocaine, crystals of borax, pieces of ice, and catechu lozenges are favorite local remedies.

As the acute symptoms pass off the value of astringents in hastening recovery is obvious. The following formula is useful:

℞.—Tinct. ferri chlor. ℥ij.
Glycerini ℥j.
Aquæ dest. ℥x.—M.

This is indicated where there is much redness of the entire mucous membrane—a condition spoken of as erythematous tonsillitis, or when very acute or formidable as phlegmonous tonsillitis. In both these conditions the tincture of iron should be given internally in full doses (30 to 60 minims) at the same time, and combined with this treatment large doses of stimulants are clearly indicated.

A good astringent gargle may be made by mixing 1 ounce of the glycerin of alum (1 : 6) with 9 ounces rose water; or tannic acid, 1 drachm in 10 ounces infusion of roses.

At a later stage the throat may be swabbed out with the two last-mentioned drugs dissolved in glycerin. Capsicum is only available in the very last stages.

Where there is fetor, weak solutions of chlorine, permanganate of potassium, creolin, iodine, sulphurous acid, chloride of zinc, or very dilute bichloride of mercury are indicated.

As convalescence is approached, tonics with the mineral acids, iron, quinine, and bitters may be indicated.

Acute tonsillitis is to be treated upon exactly the same lines as the follicular tonsillitis or sore-throat—many cases of either disease running into the other or becoming undistinguishable.

Antipyrine or salicylates internally, hot poultices externally, with steaming over boiling water and sprays of carbolic acid, to which a little glycerin of borax and cocaine have been added, are the main drugs to be relied upon.

Abscesses, as they occur in the tonsil, may be evacuated when the suffering is great. This may be accomplished by taking a sharp-pointed bistoury, and protecting its blade with a layer of strapping until within three-eighths or one-half inch of its point, it may be thrust into the prominent part of the tonsil, the cutting edge being directed inward, so as to avoid danger to the internal carotid artery. The opening of large abscesses may be imperative, as deaths have occurred from suffocation caused by their pressure or by the pus being discharged

into the air passages, especially during sleep or by the supervention of œdema of the glottis. Tracheotomy may be demanded, but the indications for its performance are very rare indeed.

Cocaine, 4 or 6 per cent. solution, should be well swabbed over the tonsils and pharynx before the knife is used, and the local anæsthesia produced by it will enable the surgeon to insert his index-finger against the swollen tonsil, while the fingers of the opposite hand are made to cause firm pressure against the tonsil from without at the angle of the jaw as he feels for fluctuation. As the abscess has been often known to burst during the act of vomiting, it has been suggested that an emetic should be given with the view of causing its rupture.

The treatment of enlargement of the tonsils may, for convenience, be here referred to,

The first step in the treatment should be to remedy the constitutional condition, of which the chronically inflamed or hypertrophied tonsils may be regarded as the local manifestation.

In the great majority of cases this will be found to be scrofula, and the various agents found useful in the treatment of chronically-enlarged strumous lymphatic glands may be tried with the view of reducing the lymphatic growths in the tonsils. Iodine internally, combined with iron and cod-liver oil, and hypophosphites, sea air, good food, and the various remedies mentioned under scrofula, upon page 773, should be resorted to with some hope of success, even in very indolent cases.

Locally astringents, as the glycerin of tannin (1 : 5), may be painted night and morning over the tonsils, but the result is generally disappointing. Tincture of iodine or chloride of iron may be painted on twice a day; but of all applications the writer has obtained the best results from the following applied twice daily by means of a large camel's hair pencil:

℞.—Tinct. iodi ℥jss.
Glycerini aluminis (1 : 6) ℥j.—M.
S.—To be used as directed.

Where the iodine causes nausea or irritation the plain glycerin of alum may be used, or the iodine may be replaced by 4 drachms of the glycerin of carbolic acid (1 : 5). Alum in fine powder may be insufflated, or the recesses of the tonsils may be filled up with it; but, as a rule, this treatment causes so much discomfort and yields so little apparent benefit that it is given up very soon. Gargles in every form are useless, save in allaying attacks of acute catarrhal inflammation upon the top of the old hypertrophy.

Where constitutional remedies and the local agents fail after a reasonable time (say three months) to make an impression upon the size of the organs, operative measures are clearly indicated. Puncture, after cocaine has been used, may be tried next. The fine point of the

galvano-cautery at a dull, red heat is to be pushed into the tissue of the gland in several places. This treatment is to be practised every third day for about a month or six weeks. The results obtained by Valat and others are very satisfactory.

Where failure ensues the tonsil should be removed, or the hypertrophied growth sliced off. This can be readily done by seizing the gland on its inner aspect by a forceps or vulsellum, and slicing off a sufficient amount by a sharp blunt-pointed bistoury, with the blade protected by lint or plaster for about ¾ of an inch from the point, the incision being made upward and inward. The "guillotine" is, however, nearly always used. By this simple contrivance any depth of growth can be removed without danger. The writer had, however, experienced difficulty in using it where the tissue of the tonsil was very tough and firm, until he learned by applying with his index-finger pressure from without to steady the swollen gland before the advancing blade of the instrument; by this plan the worst cases are easily sliced.

As a rule, the hemorrhage is very slight, and is best stopped by the galvano-cautery, or by strong solution of chloride of iron. See also under Laryngitis, Pharyngitis, and Hoarseness.

THROMBOSIS—See **Phlebitis**, page 632.

THRUSH—See **Stomatitis**, page 785.

THYROID GLAND DISEASES—See **Goitre** (page 283) **and Goitre, Exophthalmic** (page 287).

TIC DOULOUREUX.

Under Neuralgia, pages 521 to 536, the treatment of this affection is fully detailed. In that article it was neuralgia as it affects the trigeminal or trifacial nerve, which was before the mind of the writer. Hypodermic injections of morphine to relieve the very acute agonizing attacts of pain are indicated at the beginning. The relative values of butyl-chloral, gelsemium, chloride of ammonium, quinine, cannabis indica, antipyrine, exalgine, blisters, electricity, nerve section, and other agents are discussed upon the pages referred to.

TINEA.

Under this term is included ringworm, as it affects the different parts of the body. Thus, when the parasite—trichophyton tonsurans—infests the skin upon which the beard grows, it generally receives the name of tinea sycosis, and its treatment is detailed under Sycosis, on page 805; but it will be observed that there are two varieties of that affection, the remedies suitable for each being detailed. One of the varieties is not caused by the trichophyton.

When ringworm affects the body, it is generally spoken of as herpes or tinea circinata, and the treatment of this condition may be first

detailed, as it is much simpler than when the parasite attacks the hairy scalp—tinea tonsurans.

In ringworm of the body, almost any antiparasitic remedy will suffice to stamp out the disease in a very short time if in the early stages. The writer, in a pasture-land district, had a very large experience of this complaint upon his entry into the profession. The disease is communicated directly by cows, and often assumes a formidable appearance in those individuals contracting it directly from the animals. Even in severe cases he noticed that the scalp and hairy parts of the face were very rarely affected, and a few applications of the ointment of the iodide of sulphur (½ drachm to 1 ounce lard) very soon caused its destruction.

Of the hundreds of agents used against tinea, there is none to be compared with this for quickness of action and efficacy. It has, however, its drawbacks, especially when rubbed into sensitive skins, as it causes eczema and often severe irritation. The thick skin of the agricultural laborer, exposed to the varying vicissitudes of an out-door life, will bear an ointment of 1 : 8, but the city clerk or school-girl may suffer from the application of even quarter this strength.

As stated under Sycosis, this ointment should be very carefully compounded, and it is best to have it prepared for some time before being used. When these precautions are taken, the above ointment may be used for some time without causing much irritation, and it will be found exceedingly satisfactory in all forms of the disease.

Tincture of iodine often suffices after a few applications.

Chrysophanic acid ointment is also highly efficacious.

Oleate of mercury, citrine or white precipitate ointment, carbolic acid, iodine ointment, strong acetic acid, creasote, menthol, thymol, corrosive sublimate, sulphurous acid, gunpowder made into a paste, even writing ink, and, as already stated, almost any of the hosts of parasiticides, suffice to destroy *trichophyton tonsurans* on the smooth parts of the skin. The physician must always remember that the eczema produced by these agents may remain long after the parasite is dead, and it is liable to be kept up for an indefinite period as long as the use of the remedy is persisted in. It is thus not a rare occurrence for patients to present themselves to a physician who are suffering from the abuse of agents long after the necessity for their application has passed away. The cessation of the irritating ointment or lotion, and the application of a little lard, lanoline, or oil, suffices in a few days to demonstrate the nature of the case.

When the parasite attacks the hairy scalp, the treatment of the disease will often weary the patience of both physician and victim. If seen to at the very beginning of its progress, prompt treatment will generally prove nearly as satisfactory as in ringworm of the body.

The ungt. sulph. iod. may be tried with every hope of a speedy cure if the parasite has not already got a good start in its march toward the recesses of the hair follicles. Before applying remedies the hair must

be carefully clipped as short as possible over and around the diseased area. At a later stage shaving and epilation may be necessary. The (1 : 16) ointment is then to be rubbed into the spots, the margins receiving a fair share of attention, the application being repeated as often as possible without causing undue irritation.

In about ten days the applications may be discontinued, and as the irritation caused by the remedy subsides, a fair idea of the success or failure of the battle will be obtained by a careful examination of the hairs in the affected region. If these show the characteristic stumpy, broken, and irregular appearance, it is clear that more radical measures are necessary.

The great majority of cases presenting themselves for treatment for the first time will be found in this stage. If many such spots exist, it will be advisable to clip or shave the entire scalp, but the irregularly-formed hairs or stumps must be removed singly or in limited groups by pulling them out with epilation forceps. This process will require many repetitions during the tedious treatment of all bad cases, and it will be necessary to teach the nurse or relatives of the patient how to perform it skilfully.

After epilation the ungt. sulph. iod. may be rubbed in; and as the object of the physician is now to cause irritation or blistering, so as to loosen the remaining stumps and permit the remedy to get into the recesses of the tissue, a stronger ointment than the above may be resorted to. It may be necessary at intervals to cause actual vesication by repeated applications of blistering liquid or of the strongest acetic acid. Poultices or warm fomentations may be employed for the removal of the scabs caused by the blister, after which the parasiticide may be freely rubbed in. This treatment, coupled with epilation and a thorough washing of the scalp once every week or ten days, will in time eradicate the disease.

As long as a single broken or brittle hair-stump remains, the affection, if let alone, will burst out again. At this stage it will be necessary to go over the diseased area with a lens in a good light, and as soon as the young, well-formed downy hairs are found to sprout over the region, hostilities may be suspended and the patient permitted to mix among other healthy children.

To the student the treatment of this affection is most perplexing, chiefly because of the hosts of different agents recommended, every specialist urging the superiority of some particular parasiticide; and it must be clearly recognized that it is not to any great degree in the choice of the weapon which he selects, but to the skill and, above all, to the patience which he exercises in its use that success depends. Though the writer begins and ends the treatment of ringworm with the iodide of sulphur in most cases, sometimes during the progress of the disease this agent must be left aside, and less irritating substances substituted. A close study of a few typical cases from day to day will soon show him what variations are necessary in the remedies or in the

manner in which they are to be employed. It is advised sometimes to change one remedy after another every week or fortnight until the disease yields, and the writer has heard a celebrated specialist recommend physicians to "ring the changes" until a remedy is lighted upon which will destroy the parasite. This is not to be seriously accepted. It is only by the constant observance of the action of a few good agents, when employed under the ceaseless changes of conditions such as take place in chronic tinea tonsurans, that skill in the treatment of this affection can be acquired.

An oleate of mercury ointment may be used from the very beginning, and it gives excellent results, and in many cases it is preferable to the iodide of sulphur in thin-skinned patients.

Glycerin of carbolic acid (1 : 4) is also much praised, but this agent in the writer's hands has been disappointing.

Some of the French physicians adhere to the application of a 1 per cent. ointment of protochloride of iodine in lanoline, rubbed in after spraying the scalp with warm water and thoroughly drying, and they affirm that epilation is never needed under this treatment.

Vidal maintains that the parasite is aërobic, that all that is necessary is to deprive it of oxygen and it must die, and that this can be achieved by covering the part with vaseline. Nevertheless he uses a weak iodine ointment (5 grains to 1 ounce), and covers it with gutta-percha tissue. He is probably correct in his aërobic theory, but the experience of every physician proves that ringworm of the scalp may cease to grow, but still may exist for many months or years under a layer of greasy ointment or pomade.

Thin, with more reason, maintains that ringworm of the scalp can be certainly cured by agents which do not destroy or even lower the vitality of the spores, and this he has ably demonstrated to take place under the use of croton oil. He has shown that spores which are soaked in the pure oil grow luxuriantly after their removal from it, and he has satisfied himself and many others that it is the irritation or inflammation produced by ringworm remedies, and not by virtue of their parasiticidal properties, that they cure the disease in the scalp. Croton oil is, however, liable to cause much irritation, and baldness may result from it.

If the views of Thin be correct, there is no difficulty in seeing how the iodide of sulphur acts so efficiently, but even if these views are to be accepted as correct, it still stands to reason that such an agent should *more quickly* destroy the disease than a pure irritant.

Harrison recommends a prophylactic pomade for the heads of all children in a house where ringworm has broken out. Its formula is: Ointments of eucalyptus and boric acid, of each 2 ounces; cocoanut oil, 2 ounces; and oil of cloves, ½ drachm. He strongly recommends the following ointment for the established disease: Caustic potash, 9 grains; carbolic acid, 24 grains; lanoline and oil of cocoanut, of each 4 drachms, perfumed with cloves or rosemary.

Hutchinson's plan of treatment is undoubtedly a good one in all very chronic cases. He advises the hair to be shaved or cut close, and the scalp to be washed well twice a week with a teaspoonful of liquor carb. deterg. in a pint of water, and the following ointment to be rubbed in once or twice daily according to the effect produced:

℞.—Acid. chrysophanic.	ʒj.
Hydrarg. ammon.	gr. xx.
Lanolin. purif.	ʒj.
Adip. benzoat.	ʒvj.
Liq. carb. deterg.	♏x—M.

He wisely states that "The secret of success consists in the patient continuance of the same remedy. I usually promise with great confidence a cure to the persevering, but never a rapid one. It is only the impatient who are disappointed. Those who change every few weeks from one remedy to another find ringworm almost incurable." He further states that he has never seen chronic ringworm resist careful and persistent application of chrysophanic acid. Unna also depends upon it. Bertarelli employs pitch plaster for epilation before applying the bichloride of mercury.

Boric acid, salicylic acid, tar, sulphur, and sulphurated potassium ointments, have been used by some who consider time no object. They will cure if persisted in, and cause very little irritation. The same may be same of oil of cade, oil of naphtha, paraffin, ichthyol, and most essential oils. Even cod-liver oil has its list of cures when applied locally.

Some authorities reject greasy applications altogether, and adhere to watery or spiritous solutions, and these appear to do well in some cases. One of the most drastic applications is that of Quinquaud. He applies it daily after shampooing the head:

℞.—Hydrarg. iodidi rub.	gr. iij.
Hydrarg. chloridi corros.	gr. xv.
Spt. vini rectif.	ʒx.
Aquæ dest.	℥viij—M.

After applying this he curettes all the diseased spots, and in a week, he epilates and applies a plaster of the biniodide of mercury.

Cavafy's lotion is used in the early stages of superficial and extensive ringworm of the scalp. Its formula is:

℞.—Acidi borici	ʒj.
Æther. sulphuric.	℥j.
Spt. vini rectif.	℥v.—M.

This should be sponged over the affected spots several times a day. It is of no use whatever when the disease has already invaded the hair-bulbs.

The tincture of iodine is, perhaps, the best of all the liquid preparations. Some physicians even get excellent results from a weaker tincture. Very inveterate spots may be touched occasionally with iodized phenol (1 ounce iodine and 4 ounces carbolic acid), or with a modification of Coster's paint, consisting of 1 ounce iodine and 1 ounce creasote or oil of cade. Strong acetic acid is sometimes used all through the treatment when oily or greasy preparations are objected to, and every known soluble parasiticide drug may be used in the form of lotion.

Sulphurous acid is frequently employed, but it does not penetrate to a sufficient depth. This is the objection to watery solutions, viz., that they do not penetrate into the bottom of the hair follicles.

When lotions are employed the scalp should be washed daily, and the best way to do this is to employ borax instead of soap in the water used for washing.

Shoemaker's method of treating ringworm of the scalp deserves special mention. He condemns cutting, shaving, epilation, and blistering as worse than useless, and begins the treatment of a case by sponging the diseased spots over with a weak alcoholic solution of thymol, borax, napthol, or mercuric chloride, and then thoroughly saturates them with a 50 per cent. solution of boroglyceride, which latter remedy he feels cannot be too highly extolled. It is mopped on with a brush, and rubbed in with the fingers. If this fails, without epilating he proceeds to rub in the ointment of the oleate of copper, prepared with either 4 or 9 parts of a fatty base. A little only need be applied. In chronic cases he alternates this treatment with applications of the oleate of mercury of 5 per cent. strength for children, and 20 to 30 per cent. for adults.

He states that he has never once seen salivation produced by this remedy, though he rubs it in twice daily for weeks until the parasite is completely extirpated.

In the form of ringworm of the most chronic and inveterate type where the parasite has got down deep into the hair follicles before the disease has been noticed, and where it is scattered over the entire scalp in very small detached spots here and there, the treatment is most tedious and disheartening. A modification of Alder Smith's method may be tried in such cases. The scalp is to be searched over with a lens, and wherever a stumpy hair or small group of such appears, the spot is to be touched with a very fine camel's hair pencil dipped in croton oil. This should be done for several days in succession, and if free pustulation does not occur, a warm linseed poultice may be applied over all.

This method is very different from the routine application of the oil to large tracts of the scalp, a plan, though efficacious in many instances, is, as already mentioned, liable to be followed by severe irritation and even baldness. The suppuration around and in the minute spots causes the broken hairs to be protruded from their sockets, as in the variety

of ringworm known as kerion. As a final touch to the parasite, a strong oleate of mercury ointment may be rubbed into each spot.

In tinea kerion, nature has already almost effected a cure, and the inflammation caused by the parasite has led to the falling out of most of the hairs. In this case epilation of the remaining loose hairs, and the application of a *weak* bichloride of mercury or a strong lead and opium lotion, suffices to speedily perfect the cure. Boroglyceride does well in these cases.

During the entire period of treatment the patient's head should be covered by a small silk cap; and rigid precautions are to be taken, especially in the case of schools, where each child should have separate sleeping accommodation, with washing and toilet requisites.

Liveing warns against the use of greasy or sticky prophylactics, and insists upon the head being well washed daily with warm water and soap, but Hutchinson believes that it is to the decline in the fashion of using greasy pomades that the prevalence of ringworm is now due.

In schools, the writer depends upon a pomade or oil containing paraffin, and the immediate application of the ointment of the iodide of sulphur to all suspicious spots as they appear. Hutchinson recommends his own treatment highly in the case of schools, but the writer has had experience of the iodide of sulphur in several outbreaks of ringworm in a large charity school, and he believes it cannot be improved upon.

Though there is not so much in constitutional treatment as many writers claim, nevertheless, successful management of chronic cases may not be possible until the general health is improved. This is especially true in those cases where troublesome eczema or impetigo complicates the disorder. Cod-liver oil, quinine, iron, arsenic, and other tonics, in combination with pure sea air and good food, may be tried.

TINEA FAVOSA—**See Favus**, page 263.

TINEA SYCOSIS—**See Sycosis**, page 805.

TINEA TARSI—**See Blepharitis**, page 70.

TINEA VERSICOLOR—**See Pityriasis Versicolor**, page 661.

TINNITUS.

The treatment of this sometimes distressing symptom will depend entirely upon the cause. Thus, where wax or any foreign body lies against the tympanum, its removal is followed by instant relief.

In throat affections and in Eustachian obstructions air must be permitted to enter the tympanic cavity. Inflammation of the middle or internal ear may give rise to it. (See Ear Diseases, page 218.) Though any local cause sufficient to produce irritation of the acoustic nerve or

alterations in the local blood pressure, will commonly produce tinnitus, it must not be forgotten that it may be reflex—produced by dyspepsia, renal, and hepatic diseases, and by the irritation arising from decayed teeth, etc.

Where the symptom arises from incurable local conditions or from central nervous affections, some relief may be obtained from a combination like the following:

℞.—Acid. hydrobrom. dil. ℥jss.
Liq. potass. arsenit. ℥ij.
Strychninæ gr. jss.
Aquæ camph. ad ℥vj.—M.

S.—One measured drachm to be taken three times a day in a wineglassful of water, after meals.

Chloride of ammonium alone, or with bromide of ammonium in doses of 15 grains each, has often given relief in the writer's hands in very chronic cases. Locally, blisters behind the ears or veratrine ointment may give relief; sometimes air charged with vapor of chloroform injected into the Eustachian tube for a time dispels the discomfort.

TONGUE, Diseases of.

Under Cancer, upon page 101, the treatment of malignant affection of this organ is briefly detailed.

Removal of the entire organ may be achieved by the use of the écraseur through the mouth, or through an incision in the floor of the mouth, so as to apply it as far back as possible. The galvano-cautery has also been used; but both these operations are now not so frequently done, owing to the sloughing of the tissues following them. The écraseur is, however, still much used in conjunction with the knife and scissors, as the hemorrhage is more under control by its use. Thus Baker splits the tongue for its entire length through the middle line. After cutting all the muscular and mucous attachments of each half with scissors, he then draws it well forward by stout threads passed through each half and lays the écraseur on well behind the diseased structure. Each half is removed separately. He employs stout whipcord instead of the chain.

Whitehead excises the entire organ by means of scissors only. The tip is well drawn forward from the gagged mouth by a strong thread passed through it. After snipping through the frenum and all the muscular and mucous attachments, the organ is easily removed with but slight hemorrhage, the lingual arteries being tied or twisted as they are cut, and a ligature through the base is left in for a day.

Many complicated operations are planned for the removal of the organ after dividing the lower jaw. Those of Syme, Langenbeck,

Sédillot, Billroth, Regnoli, and Kocher are done in this way, but they have steadily given way to the safer and more expeditious methods of Baker and Whitehead.

The floor of the mouth should be well packed with iodoform gauze, and the powdered drug dusted freely over the stump.

Food is administered by a rubber œsophageal tube and by the rectum, Hemorrhage may be controlled by ice, by the puff-ball, or by pressure.

Inflammation of the tongue is to be treated as described under the article Glossitis, upon page 283.

Superficial ulcerations are to be dealt with as mentioned under Stomatitis, upon page 785, and under Aphthæ, page 51.

Syphilitic affections of the tongue are to be treated by the rules and principles mentioned under Syphilis, page 810. Ulcerations may be freely touched with the acid nitrate of mercury, or with the solid caustic stick.

Hypertrophy of the tongue or macroglossia has been, when of limited extent, successfully treated by pressure in a few cases. Any concentrated astringent solution which does not produce irritation may be applied on strips of lint wrapped around the enlarged and protruding organ. Over these, strips of isinglass plaster may be placed so as to exert moderate pressure in a uniform manner.

In some instances, when the tongue can be retained inside the mouth, benefit has been obtained by pushing it back and keeping the jaws together by a rubber or other bandage passed over the head.

As a rule, where the enlargement is great, the question of operation will have to be met. This may be done by the knife, scissors, écraseur, thermo- or galvano-cautery. A few stout needles are passed through the enlarged organ in front of the spot where the section is to occur, the tip being well pulled forward, the écraseur is laid on, and the anterior portion of the tongue removed.

Where the deformity is not so great the favorite operation is to make a Λ-shaped incision, and remove the wedge of tissue by the knife or scissors, after which the edges of the incision may be brought together by a series of deep and superficial wire sutures after any bleeding vessels have been secured and twisted or ligatured with catgut. When the surgeon has the choice of time he may defer operation until about the end of the fourth month, but where feeding is rendered difficult he must operate sooner.

All authorities who have written upon this peculiar malformation recommend cod-liver oil, though it does seem to the writer very difficult to conceive how it can possibly do any good.

Neuralgia of the tongue is a rare disease; but, by a strange coincidence, a typical case presented itself to the writer when engaged in writing this brief article on diseases of the tongue. The only hope in this affection of any permanent relief will lie in

the persevering use of the remedies mentioned under Neuralgia, upon page 522. Beginning with large doses of quinine, combined with chloride of ammonium and a little morphine, the various anti-neuralgic agents should get a fair trial, while, by improving food, change of air, freedom from worry and other ills, the general health is brought up to the highest standard. A weak continuous current passed through the organ gives good results, if steadily adhered to, and relief has been known to follow even a few applications of the battery.

Locally much may be done to afford ease. Cocaine dissolved in glycerin (12 grains to 1 ounce) may be tried, or tabloids of cocaine, or lozenges of carbolic acid.

The writer has found the following combination give almost instant relief:

℞.—Cocainæ hydrochlor. gr. xx.
Glycerini boracis (1:6) ℥j.—M.

S.—A little of this liquid to be brushed over the tongue every hour or two hours during the day, and always a short time before taking food.

In the instances of this affection which have come under the writer's notice, the pain was so much aggravated by movements of the tongue that the patients were compelled to keep it at rest, and this led to retained secretions filling the floor of the mouth. To prevent this it will be necessary to wash out the mouth frequently, and the best wash for this purpose is a weak carbolic acid lotion. Condy's fluid may be tried when there is any decomposition. The movements of the tongue may interfere with the feeding, and hence it is well to have the food administered in the liquid form. Section or stretching of the gustatory nerve may be resorted to when the ordinary anti-neuralgic remedies fail.

The injection of various anodyne solutions, as morphine, etc., into the substance of the tongue is not to be recommended, but a full dose of the last mentioned drug may have to be administered under the skin below the lower jaw if the paroxysms of pain become very severe.

Butlin recommends the local application of menthol.

The peculiar condition of the tongue known under the various names of *psoriasis*, *ichthyosis*, *tylosis*, *keratosis*, and *leucoplakia*, and regarded by some authorities as of the same pathology as corns or callosities, give little satisfaction to the therapeutist.

It resists drugs, and often resents interference of all kinds and finally may become the seat of a disease not to be distinguished from epithelial cancer. The keynote to treatment lies in the fact that this affection is often the result of the action of an irritant either in the form of a ragged decayed tooth, or it may be produced by smoking or drinking alcoholic liquids, probably both practices combined. Hence

the extraction of any irritating tooth or teeth, or the filing down and polishing of their crowns, and total abstinence from tobacco and alcohol should be insisted upon. Very hot liquids are likewise to be forbidden.

Excision of the patch, when this is small, gives the best results, but all authorities are agreed that caustics only increase the mischief.

The galvano-cautery may be used to advantage in some cases.

Tongue tie is remedied by the simple operation of snipping the frenum, which is generally resorted to much more frequently than is necessary. The most satisfactory method of operating is to pass in the index-finger and the next one under the tongue, the frenum being put upon the stretch between them, and, with a curved scissors, the point being held downward, the constricting band is divided by a single snip, care being taken not to divide the ranine vessels as the child struggles. For the treatment of Ranula see page 738.

TONSILS.

The treatment of inflammation and enlargement of the tonsils is detailed under Throat, Sore, upon page 832.

TOOTHACHE.

This is but a symptom of caries, periostitis, exostosis, impaction of a wisdom tooth, inflammation of the tooth-pulp, or other local cause, which must be carefully distinguished from neuralgia. When possible, the cause is to be found out and remedied, but in the great majority of cases this will be found to be owing to irritation produced by caries. The cavity should be gently but thoroughly washed out, dried with a little cotton wool, and any of the following local anæsthetics inserted into it on wool—creasote, carbolic acid, chloroform, oils of cloves, cajuput or peppermint.

The packing of the pulp-cavity with drugs in the dry state is sometimes resorted to. Thus cocaine, chloral, butyl-chloral, camphor, menthol, morphine, opium, antipyrine, or exalgine, may be placed in the hollow, and kept in position by a little cotton wool loosely packed upon the top. The best results are obtained by injecting through the dead pulp cavity a little pure creasote or camphorated chloroform down into the hollows in the fangs.

Where there is very severe pain originating in the living pulp of a carious tooth, the most satisfactory method will be to remove any stoppings, if such exist, or to gently remove any carious dentine until the pulp cavity is well exposed, and then by a minute quantity of powdered white arsenic left *in situ* by a plug of cotton wool the vitality of the pulp is to be entirely destroyed. Chloride of zinc and nitric acid or solid nitrate of silver may be used in the same way.

Tomes points out that for the relief of pain a dead tooth should be left quite open, and a live tooth sealed closely up. This is seen where

the pain results from pus in the pulp-cavity. No relief can be expected until the pulp cavity is opened up and the matter evacuated, and further tension prevented by leaving a way for free exit.

The best routine local anæsthetic for relieving the pain of an inflamed pulp cavity is a mixture of carbolic acid and collodion. This obliterates sensibility, and seals up the chamber if applied carefully upon cotton wool. Cocaine may be combined with the acid. It will be remembered that this application should not be used to seal up a dead pulp cavity in a tooth where acute pain is produced by some inflammatory action in the neighborhood of the tooth or in its roots.

℞.—Collodii ℥iij.
Acidi carbolici (cryst.) ℥iij.
Cocainæ hydrochlor. gr. x.—M.

S.—A small portion to be applied upon cotton wool to the dried-out pulp cavity of the painful tooth.

The popular remedies for external application are of little use, and the plan of rubbing aconite, belladonna, or chloroform along the gums does more harm than good. The anti-neuralgic remedies internally are also not to be relied upon as long as the local conditions remain unattended to. It is hardly necessary to insist upon the importance of saving the tooth. Extraction should only be resorted to when the disease in the tooth substance is too extensive to permit of the hope of a solid stopping being inserted after the subsidence of the acute symptoms.

Chewing of pellitory root sometimes relieves the pain depending upon congestion of the fangs or of the periosteum.

Extraction may be the only means of giving relief where the pain is caused by the impaction of a wisdom tooth. If possible, the wisdom tooth itself should be removed, as it is generally much less valuable than the molar in front of it, but this latter may have to be sacrificed if the wisdom tooth cannot be brought within the grasp of the forceps.

TORTICOLLIS.

As this condition arises from several distinct causes, the treatment cannot be commenced until the cause at work is thoroughly made clear. In those cases occurring soon after birth, where a hard tumor can be felt along the course of the sterno-mastoid muscle, the deviation of the neck is clearly owing to the rupture of the muscle during labor. The writer has seen a considerable number of these cases during many years' practice in the extern department of a children's hospital, and he has never known an instance where the affection did not pass away completely. Friction with any mild lubricating oil or the lin. potass. iod. cum sapone (B. P.), and the envelopment of the

neck in a thick collar of cotton wool, always was followed by disappearance of the tumor and of the deformity.

Where wry-neck is *spasmodic*, it presents sometimes one of the most obstinate complaints that can come before the physician. This acquired form has been submitted to great variety of treatments. As a rule, it may be laid down that tenotomy is very seldom successful, and that very often it considerably aggravates the deformity. After dividing the tendon, various plans have been tried for fixing the head in its natural position, but such appliances are seldom successful.

Levrat, after dividing the tendon of the muscle and suturing the wound, fastens a rubber band between hooks attached to a silicated bandage. This band is to assist the sound muscle to overcome by its continuous action the opposing one. It runs in the direction of the muscle from the mastoid to the axilla of the same side.

Stretching or resection of a portion of the spinal accessory nerve has succeeded sometimes in spasmodic torticollis, but it has also failed. The operative treatment of the spasmodic variety being, therefore, so unsatisfactory, it never should be entertained until other measures have failed. The mere adjustment of an apparatus with the view of tiring out the opposing muscle has been tried, and in a few cases has been tried, and in a few cases has succeeded, but, as a rule it fails, and during the period in which it is tried the patient often suffers great discomfort.

Electricity or galvanism has given excellent results in many cases, and if resorted to early there may always be a fair hope of success. It must, however, be persevered with for some time. There are various plans for using this agent. The best is to begin with a very mild *continuous* current to the affected or constantly contracting muscle for fifteen minutes three times a day, and when the spasm is controlled, to educate the patient to use the affected muscle in various ways, as in turning the head in different directions. Fifteen Leclanché cells will suffice, with one pole (the positive) near the mastoid bone and the other near to the clavicle.

The opposing muscle is generally found weak, and it should have the *interrupted* current passed through it from time to time, in order to cause lively contractions, massage being employed twice a day. By increasing in this way the tone and power of the weakened antagonizing muscles, and controlling or modifying the spasm in the affected sterno-mastoid and other muscles, great good or permanent cure may be obtained in a fair percentage of cases. This plan has succeeded admirably in the writer's hands.

Bromide of potassium in large doses, with arsenic internally, may be always tried, and some cases have been reported as cured by the hypodermic injection of gelsemium after tenotomy or myotomy had failed. Weir Mitchell recommends very large doses of this latter drug, so as to produce *very pronounced* physiological action. He

begins with 3 minims of Wyeth's fluid extract three times a day, until eight times this amount is taken.

Curare and morphine have been injected, conium given in large doses, and hyoscine administered, but their effects rapidly pass off. They may be used, however, to great advantage when other means, as galvanism are having a trial.

In those cases of torticollis following old disease of the bones in the neck, tenotomy is generally of much value. The tenotome is entered a little above the clavicle, and both portions of origin may require to be cut. After the wound has healed exercises are to be commenced and carried out with great persistence, while massage is to be done two or three times daily.

Lately many surgeons have reported successful cases after division of the tendon or muscle through an extensive skin wound. Summers makes his incision parallel to the clavicle, but does not suture the wound. Collier reported recently a very interesting and successful case in which he cut down and placed a loop of silver wire upon the spinal accessory, twisting the ends to insure slight compression, and leaving the ends of the loop protruding from the wound.

TRISMUS—See Tetanus Neonatorum, page 830.

TRANCE.

Under Hysteria, on page 382, the treatment, moral and medicinal, for the condition which generally underlies trance will be found. If the state of trance be not very "deep," the treatment described under catalepsy will be successful. Electricity in the form of a strong interrupted current should be used in all cases, and when there is any evidence of a return to half-consciousness the battery should be at once applied to the arms and legs. Snuff, strong ammonia, nitrite of amyl, etc., may be used at the same time, but they are of little value in genuine trance. When these measures are used at the same hour each day, as Gowers recommends, there may be induced a tendency to periodical waking, which will ultimately culminate in a cessation of the attack. Until then every attention must be paid to the maintenance of life. Feeding should be carried on by the rubber tube of the stomach-pump, introduced through the nose or mouth.

Rectal alimentation may be essential also in prolonged cases. Strong tea and coffee are indicated.

By the judicious application of warmth and skilful nursing much may be done to minimize the exhaustion sure to follow, especially in those case where food cannot be administered.

Antispasmodics, as bromides, musk, valerian, asafœtida, sumbul, and other anti-hysterical agents, may be given by the bowel or by the nasal tube, but they do little good, and the first mentioned drug may do harm.

Reasoning from the observation that strychnine so often aggravates the abnormal sensations complained of by the hysterical patient, the writer believes that the best drug treatment in this affection may be found to be the steady administration of strychnine by the hypodermic syringe with the view of increasing the sensitiveness of the nerve centres and the peripheries of the sensory nerves and nerves of special sense.

TRICHIASIS—See under Entropion (page 244).

Epilation of the irregularly growing hair may be all that is required in mild cases to give temporary relief, but as the hair grows again the trouble is almost certain to return.

The hair-bulbs must be destroyed. This is most easily accomplished if there are but a limited number of them producing the mischievous lashes by inserting a needle into the hair follicle, connecting it to the negative pole of a battery, while the positive pole is placed over the skin in the vicinity of the eye.

Where a considerable number of the hairs are at fault, the best plan is to make two parallel incisions along the margin of the lid, and to carefully dissect out the hairs and their hair bulbs.

The operation of transplantation is to be performed when the entire row of hairs is faulty; it is done by splitting the lid along is marginal surface between the hair-bulbs and the Meibomian follicles and excising an elongated or elliptical piece of skin from the outer margin of the eyelid and fastening the cut surfaces by sutures, so as to draw away the ingrowing hairs (page 244).

TRICHINOSIS.

The preventive treatment of this serious disorder is practically all that need be considered, as we know of no agent which will destroy the parasites once they have become encapsuled in the muscles. In the case of food it is satisfactorily proven that there is no chance of the disease being communicated if the cooking has been very thorough, it must be remembered that trichinæ may find their way into the human body not only from the uncooked flesh of the pig, but also from that of eels and pigeons. A temperature of 160° F. will destroy the parasite, but it will resist freezing for considerable periods, and the process of curing by the ordinary brine solutions has no effect whatever upon it.

After the ingestion of trichnized food in the stage in which nausea, vertigo, diarrhœa, and fever are present, the best treatment will be to clear out the stomach by means of a good emetic, followed by a large dose of some smart purgative, as 1 or 2 ounces of castor oil, 10 or 20 grains of calomel, or 2 or 3 ounces of black draught or white mixture. These can be repeated for five or six days or more. Fever is afterward to be combated by the administration of small doses of antipyrine, and

every effort made to keep the patient's strength supported by means of absolute rest in bed and by feeding with peptonized foods, in order to tide him over the period of acute danger, while the progeny of trichina —embryos—are migrating into the muscles. Rectal feeding may be necessary, and free supply of stimulants are called for in some cases.

The administration of anthelmintics or of antiparasitic agents, like arsenic, picrate of potassium, corrosive sublimate, salicylates, and other powerful drugs may do much harm, but can do no good, and by universal consent their use is now discontinued, reliance being placed upon supporting treatment.

TUBERCULOSIS.

Under Phthisis the treatment of tubercle has been fully detailed without any reference to the recent method introduced by Koch. The present article will occupy itself with this agent. Owing to the intense public and professional interest taken in Koch's remarkable researches in the therapeutics of tuberculosis, and to the bitter disappointment which soon followed, it will be many years before the memory of the excitement of this brief period in the history of medicine will be effaced. At the present moment most medical men and many patients and their relatives look back upon it as upon a huge nightmare. By many the remedy is considered to be so thoroughly discredited that any lengthened reference to it will be deemed a waste of time, and since the details of the experiments which led up to its discovery, as well as those which have led to its abandonment, are now fresh in the minds of everyone, there is no necessity in repeating them here.

The lymph or "tuberculin" of Koch is a glycerin extract prepared from pure cultivations of the bacilli of tubercle.

As supplied to the profession, this brown liquid is estimated by Koch to contain only about 1 per cent. of the dry active principle, though in this form it is one of the most powerful agents known. There is much confusion about the strengths of the solutions.

Unfortunately if the solution be made of the proper strength for injecting it will not keep for any length of time. First, a solution of pure carbolic acid in distilled water, 1 : 200, is prepared; 1 part of Koch's lymph is added to 9 of this, making a 10 per cent. solution, which, though too powerful for use, will keep for a long time, and can be diluted as required. This 10 per cent. solution of the original lymph is known as the "mother solution"—an unhappy nomenclature, since Kœhler speaks of the original lymph as the "mother liquid"—1 part of this solution added to 9 parts of distilled water makes the solution which is used for injection. This dilute standard solution, therefore, is a perfectly clear 1 per cent. solution of the original liquid lymph or tuberculin. The dose of this is always given in the metric phraseology, with which most English physicians are not familiar, and hence mistakes or confusion arises, especially as many

authorities speak of the dose of this standard 1 per cent. solution in milligrammes, while others speak of it in cubic centimetres. In dealing with an agent of such terrible potency there should be no ambiguity about our nomenclature. The milligramme is a metric *weight* corresponding to 0.015432 of our English grain, being the one thousandth part of a gramme (which latter corresponds to 15.432 English grains).

A cubic centimetre (written c.c.) is a metric *measure* of capacity, being a millilitre or the *measure* of one gramme of water. Our minim is equal to 0.061 c.c. One c.c. will, therefore, correspond to 16.23 minims.

This confusion of weights with measures, to be noticed in many of the papers on Koch's lymph, arises from the universal practice in Germany, France, and Russia, of dispensing or compounding all liquids by weight, not by measure, as is our invariable rule in Great Britain.

Koch's syringe obviates the difficulty of translating the metric measures in their English representatives, as it is graduated in a manner to be presently described. Each division of the syringe corresponds to one decigramme, the ten divisions marked on the syringe making up one c.c. Roughly, each decigramme may be taken as representing $1\frac{1}{2}$ minims.

As pointed out by Koch in his original paper, the injection of 0.01 c.c. of the original lymph, or 1 c.c. of the standard 1 per cent. solution, produced scarcely any symptoms when injected into healthy individuals, but always a marked reaction characterized by a sharp rise of temperature and other signs when injected into any patient containing tubercle in his body. This remarkable phenomenon was considered as introducing a new method of diagnosing tubercle, and, though several exceptions have been recorded, it cannot be yet denied that it may render manifest tubercular disease not otherwise discoverable. The idea of utilizing such a terribly potent poison for such a purpose is another matter, and we may safely prophesy that it will be seldom used for this purpose in this country.

In treating tubercle of the lung or ordinary phthisis in weak or young patients by means of this agent it will be well to begin with the smallest dose. This is 0.001 c.c. of the original lymph, or 0.1 c.c. of the 1 per cent. solution. This corresponds to 1 milligramme, or about $\frac{1}{64}$ grain (English) of the original lymph, or to one-tenth of a cubic centimetre of the 1 per cent. solution (*i. e.*, to $1\frac{1}{2}$ grains). The writer mentions the equivalents in each case, because in many of the reports the observers hopelessly muddle up the quantities or doses of the original with those of the 1 per cent. solution.

In strong, robust subjects double this dose may be given, and in lupus cases ten times the amount may be administered. (Ten times this initial dose just stated will represent 1 c.c. or 15.432 grains of the 1 per cent. solution.) Having commenced with the minimum dose of 0.1 c.c. of the 1 per cent. solution, it is to be daily repeated until the

temperature ceases to be affected. It is then doubled until the temperature ceases to rise, after which it is again increased by 1 or 2 milligrammes each time until the full dose of 0.01 c.c. of the original lymph, or 1 c.c. of the 1 per cent. solution, is injected.

Koch's syringe is made to contain 1 c.c., and is graduated in decigrammes, each of which will represent a dose of the original lymph, equal to 0.001 c.c. when the syringe is filled with the 1 per cent. solution. When the very large doses are reached the 10 per cent. solution may be used. Every milligramme of it will correspond to 0.01 c.c. (the maximum ordinary dose). Large doses are used as "test doses."

The injections are to be made into the skin over the back between the scapulæ, the syringe being each time sterilized by washing with absolute alcohol. The needle should be washed in a 1 : 20 carbolic solution, and the skin in the region of the puncture should be well washed with ordinary carbolic lotion. In early lung tubercle a period of about four to six weeks completes the treatment. The temperature after injection begins to rise in three or four hours, and the highest point is reached in a about twelve hours, the normal being touched generally inside the twenty-four hours after the injection of the remedy.

Speaking of the dose of the original lymph, Koch states in his paper, November, 1890—"Our course was generally as follows: An injection of 0.001 c.c. was first given to the phthisical patient. On this a rise of temperature followed, the same dose being repeated once a day until no reaction could be observed. We then rose to 0.002 c.c. until this was borne without reaction, and so on, rising by 0.001, or at most 0.002, to 0.01 c.c. and more. This mild course seemed to me imperative in cases where there was great debility. By this mode of treatment the patient can be brought to bear large doses of the remedy with scarcely a rise of temperature. But patients of greater strength were treated from the first partly with larger doses, partly with rapidly repeated doses. Here it seemed that the beneficial results were more quickly obtained. Within four to six weeks patients under treatment for the first stage of phthisis were all free from every symptom of disease, and might be pronounced cured. Patients with cavities not yet too highly developed improved considerably, and were almost cured. Only in those whose lungs contained many large cavities could no improvement be proved objectively, though even in these cases the expectoration decreased and the subjective condition improved. These experiences lead me to suppose that *phthisis in the beginning can be cured with certainty by this remedy.*"

Regarding the treatment of lupus and tubercular disease of bones and joints, Koch began at once with the full dose of 0.01 c.c. of the original lymph (that is, 1 c.c. of the 1 per cent. solution), and, after allowing the reaction to come to an end, in a week or two, he injected the same dose until the reaction ceased to appear. The writer has witnessed most formidable and dangerous symptoms follow this dose in lupus.

Soon after the treatment of Koch had been extensively tried, it was clearly pointed out by Virchow and others that development of fresh tubercles occurred in various parts of the body, and innumerable deaths have been recorded which clearly prove that after injection the bacilli were set free and produced a general tuberculosis. In one case of lupus in which the writer gave the remedy a very prolonged trial, tubercular disease followed in one of the bones of the hand.

It is not stating the case too strongly to say that at the present date the very general conviction remains in this country, and also in the minds of most of the leading physicians on the Continent, that the lymph is thoroughly discredited, and has proved an absolute failure. Many impartial observers go so far as to state that its use is unjustifiable or even criminal.

The discovery of an agent of such marvellous and almost incredible selective power will nevertheless mark a distinct epoch in the history of medicine.

The writer has watched the action of the drug closely, and though he is satisfied of its failure and danger in every instance in which he has used it or seen it used, save in one case, he ventures to enter a mild protest against the present prevailing condemnation. It must be fairly borne in mind that the agent has demonstrated its selective action upon the tissues containing tubercular bacilli, and the innumerable failures have followed what, after all, has been the original plan of Koch for the administration of the drug. It is true his plan of using the lymph has been modified to some extent by some observers, but, as a whole, it may be said still to have always been used upon the lines laid down first by its introducer.

Without going into the various theories and explanations of its selective action, and the elucidation of how the phenomena of reaction are produced, the writer will presume to suggest that a case can be made out for the further trial of Koch's tuberculin with a fair prospect of success. At the beginning, let it be understood that the proposition is based purely upon theoretical considerations, and that these theories have at least a very large proportion of solid facts to sustain them. In the proposition which he will make he will endeavor to differentiate between theory and fact as far as possible. It may be taken as granted at the start that the tuberculin exerts no power over the bacilli. Koch himself states—"But so much is certain that there is no question of a destruction of the tubercular bacilli in the tissues, but only that the tissue enclosing the tubercle bacilli is affected by the remedy."

It may be also accepted that the danger and failure of his plan of treatment of established phthisis lies in the fact that the bacilli are freed from the tissues, and find their way by the fluids of the body into its various parts.

The discovery by Metschnikoff of the phenomenon to which he gave

the term "Phagocytosis," is one of the most brilliant and valuable in the annals of science. His paper, "Uber eine Sprosspilzkrankheit der Daphnein. Beitrag zur Lehre über den Kampf der Phagocyten gegen Krankheitserreger," appears in the *Archiv of Virchow*, 1884.

That phagocytosis occurs in many instances where disease germs are introduced within the body is beyond doubt. The writer satified himself of the accuracy of Professor Metschnikoff's researches in the living daphne, and of his wonderful observations upon various stages of the process occurring in several human diseases by an examination of the specimens kindly exhibited by the professor in his laboratory at the Pasteur Institute. The demonstration left nothing to the imagination, the specimens proving beyond a shadow of doubt the various steps by which the living cells manage to seize the bacilli and effect their complete destruction.

The most striking point in connection with this question is the fact brought out by many independent observers regarding the action of the white blood-corpuscles and other cells in animals protected by previous inoculation, and in those not so protected. If the anthrax bacilli be introduced into a healthy, unprotected rabbit there is practically no attempt made by the phagocytes to include them. The bacilli increase and multiply in the blood and destroy the animal, the amœboid cells remaining neutral.

A very different state of matters is to be seen when the bacilli of anthrax are introduced into a rabbit previously protected by an inoculation of the chemical substance prepared from anthrax cultures. The rabbit with this acquired immunity is safe. As soon as the living bacilli are injected the amœboid or white blood cells in great numbers move toward the seat of injection, and include (devour) the bacilli which are to be seen in their interior in various stages of dissolution.

It has been demonstrated by Metschnikoff and witnessed by the writer that the amœboid and giant cells include the bacilli of tubercle finding their way into the human body.

It is not too much to assume that it is by this process of phagocytosis going on in man that the majority of individuals are protected from tubercle, the bacilli of which must be finding their way into the body in myriads from the dust of cities whose streets are continually soiled by the sputa of phthisical patients.

It is useless to theorize upon the solution of the problem of why phagocytosis is successful in the majority of individuals and why it fails in the minority. Probably some attempt is made at it in all cases.

This consideration brings us to the next important step in the suggestion of the treatment of tuberculosis by a different method of employing Koch's lymph. Does the injection of this agent tend to protect against a subsequent inoculation of the bacilli of tubercle? Much hangs upon the answer to this question. The results published by

Grancher and St. Martin prove that it is easy to protect rabbits by inoculations of attenuated tubercular virus; and there is a large mass of evidence, including that from Koch himself, which goes to prove that healthy animals can be certainly to a very great degree, if not entirely, protected by injections of sterilized cultures. These results are, however, denied by others.

It is, however, not yet proposed that healthy subjects would be submitted to protective injections. The bearing of acquired immunity or protection in the case of patients having isolated foci of bacilli of tubercle somewhere stowed away in their tissues is a vital one.[1]

The tubercular bacilli shut up in the interior of the tissues, say of a lymphatic gland, may be regarded as outside the blood stream in a certain sense. We know from clinical experience that they may remain there, as they do in lupus, for half a century without any risk of general infection. We know also, in the sad experiences of the last twelve months, that Koch's lymph, if administered in the way recommended, will render the tissue surrounding the bacilli necrotic, and the speedy result will be that the bacilli are thrown into the blood stream and set up a general tuberculosis or are carried to other organs.

Now, the contention of the writer is that each injection of a full dose of Koch's lymph in such a case may be regarded for all practical purposes as an injection of living tubercular bacilli *into an unprotected animal.* The human subject in the early or middle stage of pulmonary or ether form of tuberculosis is, after each injection, in practically the same state as an unprotected rabbit into whose blood living tubercular bacilli had been injected. We know that phagocytosis does not take place, the bacilli set free from the tubercles by the "lymph" are not attacked by the phagocytes, and in the great majority of cases the state of the patient may be worse than before.

If the condition of the patient before the injection of the tuberculin could be made to correspond with that of a protected rabbit, then there would be hope for the success of the treatment of phthisis and other forms of tuberculosis by the injection of the new agent.

The writer believes this to be possible. Given a patient with the bacilli of tubercle locked up in tubercles in his lung, if the present state of our knowledge is correct, small—*very small*—doses of Koch's lymph should be given for a considerable time, say weeks, after which he is *probably* pretty well protected. Then a few large doses should be given, so as to produce well-marked reaction. The tissues surrounding the bacilli will be acted upon, and these, as they become liberated, will find their way into the blood stream, where they will be attacked by the amœboid cells and destroyed.

[1] In the ordinary use of the term, it is hardly correct to speak of acquiring immunity from a disease already existing, but the sense in which this is now used will be apparent further on.

By the small preliminary doses the organism is changed, so that the amœboid cells, instead of running away from the bacilli, as they do under the usual injections, will enclose them as they do in the case of an animal who has undergone the process of acquired protection.

The failure of Koch's treatment may, therefore, possibly be owing to the doses employed. The discoverer of the selective action of the tuberculin always aimed at producing "reaction" by using very large doses.

Instead, therefore, of commencing the treatment of a preliminary phthisis, lupus, or joint affection with $\frac{1}{64}$ or $\frac{1}{16}$ grain of the original lymph, the writer would suggest two daily doses of not more than the $\frac{1}{200}$ grain (this would be equal to half a minim of the 1 per cent. solution) for two or three weeks, or longer. One-thirty-second grain might then be given—*i.e.*, $\frac{1}{5}$ c.c. of the 1 per cent. solution, and if marked reaction did not occur the dose should be rapidly increased.

The action of the large dose, if such a method succeeded, might be likened to that of a ferret dislodging vermin from their holes in order to be devoured by an army of terriers stationed outside. The suggestion is based upon a study of the various researches recently conducted in bacteriology, and though it may break down in practice, nevertheless any plea for the further trial of this agent which possesses such certain and wonderful selective action is opportune in the present state of disappointment, when there is danger of its passing entirely out of use in practice. It is clear that its dosage and actions have not yet received the attention to which they are entitled. Looking to the future of the bacteriology question, it seems very probable that phagocytosis must receive marked attention.

One case in which the writer was satisfied that Koch's treatment effected an apparent cure was treated in an Alpine resort during the period of injection. It is just possible that the result was produced by an increased vitality in the amœboid cells induced by the altered environment.[1]

Professor Le Peine, of Lyons, was led to try the effects of injections

[1] Since the above was written, the brilliant researches of Cheyne and W. Hunter have been recently published. Both observers are satisfied that injections of Koch's tuberculin do not confer immunity. They have demonstrated the importance and necessity of a further study of the therapeutics of this powerful agent. Their researches and experiments clearly prove that tuberculin is a composite substance, and they have been able to demonstrate that it is comparatively easy to separate the *remedial* from the *fever-producing* substances. Cheyne has established what the writer has but feebly attempted—viz., he has clearly demonstrated the necessity of a further trial of this discredited agent. The concluding sentence in his last paper may be quoted: "I cannot but think that the result of the getting rid of the noxious constituents of tuberculin will be to place this treatment in a prominent position among the means at the disposal of the physician, and I look to the work of physicians for the final determination of the place which these substances shall occupy in the lists of remedial agents for tuberculosis."—British Medical Journal, August 8, 1891.

of the blood of the goat in phthisical patients from a consideration of the great rarity of the disease in these animals, and the results at one stage of his observations promised well, but in an interview recently with the writer, he stated that he had given up the research, at least for the present.

Professor Reichet has been making an exhaustive study of the action of the serum obtained from the dog. He has had this injected by an ordinary hypodermic syringe under the skin in doses of about 15 to 30 minims in phthisical patients and those suffering from lupus. The writer, who has studied the preparation of this agent in the laboratory of the professor in Paris, and has seen its effects on lupus in Professor Fournier's wards, was deeply impressed with the results. The remedy is, however, only upon its trial, and the distinguished professor to whose great kindness the writer is deeply indebted, will in due time give the results to the medical world. The recent work done by a large number of bacteriologists goes to show that there may be very great bactericidal properties residing in the body humors, and the action of an agent like dog's serum injected even in small quantities, may achieve results which would seem almost impossible to those who have not been watching the march of events in this particular field of experimental research. It is possible that good results may be obtained from a combination of the new methods.

Liebreich has been testing the action of another new tubercle cure, and various reports have (as is always the case) been already forthcoming of cures achieved by the new agent. This is cantharidinate of potassium, the dose of which by hypodermic injection is 1 to 2 decimilligrammes—*i. e.*, $\frac{1}{648}$ to $\frac{1}{324}$ grain. Serum is exuded from the capillaries throughout the body after this agent has been introduced into the blood; and Liebreich believes that this exudation may work in two ways: 1. By supplying increased pabulum to badly-nourished cells, these may be brought back to the healthy standard; 2. It may act beneficially by its disinfecting action on the diseased spot. He states, "That if it can be proved that in cantharidin we possess a means of producing an increased secretion of serum at any one spot, we may succeed in concentrating at this spot efficacious substances, which, under ordinary circumstances, do not easily find their way there. We know substances that circulate in, and are decomposed by the blood, but which only with difficulty pass through the kidneys. But if we know that at an affected spot the exudation from the capillaries is facilitated, we can imagine that a larger quantity of an efficacious substance may find its way to this spot, thus strengthening the otherwise feeble disinfecting power of the serum. It seems to me not unlikely that such a combination of two remedies might possibly lead to a new therapeutic method. As regards practical application, special attention should be paid to the kidneys. It is clear that this treatment should not be applied where there is disease of the kidney."

Tranjen has introduced a new method of treating tuberculosis which

has been approved of by Ewald. It is a solution of hydrargyrum thymolo-aceticum injected into the muscles of the buttock every eight days. After a few injections, a solution of iodide of potassium is given by the mouth—3 grains thrice daily.

Just at the present moment the new method introduced to the notice of the French Académie de Medicine by Lannelongue is occupying the attention of physicians. One may predict at first sight that it is not likely that this plan of treatment will prove successful in visceral tuberculosis, but the lookout is very hopeful as regards its utility in destroying the tubercular process in other regions of the body. He defines it as a method of prompt transformation of tuberculous products in the joints and certain other parts of the human body. It consists in the deep injection of dilute solutions of chloride of zinc into the tissues surrounding tubercular deposits in order to induce a condition of sclerosis which proves fatal to the existence or growth of the bacilli.

The effects are stated by Lannelongue to be a "fixing" and "killing" of the anatomical elements of the tissues into which the remedy penetrates, an obliteration of some of the capillaries and smaller vessels and a diminution in the calibre of the arteries and veins by setting up an inflammatory irritation in their walls. He states that an enormous proliferation of new embryonic cells takes place, not only at the seat of injection, but for some distance around it. These infiltrate the tuberculous tissue, and he believes attack and destroy the bacilli. (This may be proved afterward to be a local process of phagocytosis.)

The morbid "fixed" tissue becomes slowly absorbed, while the young cells rapidly pass into the condition of new fibrous structure. In the report of the communication made to the Académie as it appears in the *British Medical Journal* of last July, the following results are detailed:

"The injections cause considerable local pain and swelling, but, as a rule, no œdema if they have been made sufficiently deep; the integument is brought into a condition resembling the sclerema of newborn infants. In two or three days the granulation tissue is more resistant and more tense to the touch, and soon afterward nodules of almost cartilaginous hardness can be felt at the seat of injection. In course of time there is a tendency for the sclerosed tissue to become looser and more like connective than fibrous tissue. In this way the parts may recover their natural shape and suppleness. The treatment has little or no effect upon the general health. The temperature, as a rule, rises less than 1° C. after each injection, and soon returns to the normal point. Of 2000 injections given during the last seven or eight months, not one has given rise to abscess, but in four cases they were followed by hæmatoma, which M. Lannelongue believes to have been due to rupture of small vessels due to the irritation caused by the chloride of zinc. No eschar is produced if the injections are made into or under the muscular layers. For tuberculous disease of the joints, ribs, etc., and for tuberculous glands, he recommends the use of

a 1 : 10 solution, 2 drops to be injected in a number of places around the periphery of the diseased part. Suppurating glands should be washed out with an abundance of sterilized water, and in all cases the injections should be made with the most rigid antiseptic precautions.

"In tubercle of the epididymis and in spina ventosa, a 1 : 20 solution was used; two or three drops of a 1 : 40 solution were injected into the lungs. So far M. Lannelongue has treated twenty-two patients by his method, some of whom he showed to the members of the Académie. All of them were under fifteen. Twenty of them were suffering from osteo-arthritis of the limbs or spinal column, or from tuberculous glands, both non-suppurating and suppurating, and in some cases open. Two were suffering from tuberculosis of the lung. Of the former series several may be considered cured, and in all, the morbid process has been favorably modified; as regards the pulmonary cases they have not been long enough under treatment for any reliable conclusion to be arrived at."

The plan of treating tubercular abscesses and joints by aspiration and injections of iodoform emulsion as practised by Bruns, Krause, Billroth, Trendelenburg, and others, is described under Abscess, page 15.

Our recent painful disappointment in the results of Koch's method naturally renders the acceptance of the newer methods with an unusual amount of hesitation and scepticism, but it seems hardly possible to conceive how great progress can fail to be very soon recorded in this particular portion of the domain of therapeutics, when we consider the ceaseless activity displayed by the most original minds in our profession, all working toward this one goal—the destruction of the tubercular bacilli.

TUMORS.

Under various headings the treatment of tumors are referred to throughout this volume, as under Ovary, Diseases of; Spina Bifida, Lymphatic Glands, Nævi, Hydatids, Cancer, etc., so that any general remarks here are unnecessary.

The removal or non-removal of tumors, both innocent and malignant, and the best methods for removal in each particular case, are to be laid down upon general surgical principles, after the anatomical and clinical peculiarities have been fully recognized.

TYLOSIS.

Where the increased or hypertrophied epithelium in situated upon the skin, the treatment to be adopted is that noticed under Corns and Callosities, page 152. In tylosis of the tongue, the measures detailed under Tongue Diseases, upon page 844, are indicated.

TYMPANITES.

The treatment of this symptom will depend entirely upon the causes producing it. The treatment of these has already been detailed under their various headings, so that no further notice here is necessary. The reader is referred to the articles upon Dyspepsia, Intestinal Obstruction, etc.

Where the causes are not removable, agents may be employed in each case suitable to the condition of the patient. Thus, in hopeless cases of abdominal obstruction from cancer, where colotomy or other operation is contra-indicated, the abdominal wall and intestines may be pierced by a fine aspirator-needle, and the imprisoned flatus let free. As a rule, this affords but little relief. A much better plan is to make a *small* opening in the middle line, and, having secured the first coil of distended bowel presenting, to open this and leave it *in situ* in the abdominal wound. Elsewhere the writer has stated his experience of the uselessness of the long tube introduced into the rectum. Enemata of turpentine, creasote, asafœtida, and the internal administration of these agents at the same time, alone or combined with galbanum, musk, ammonia, alcohol, charcoal, ginger, capsicum, cajuput, peppermint, etc., may be tried.

TYPHLITIS.

The treatment of this condition will be found detailed under Peri-typhlitis, upon page 612.

TYPHOID FEVER.

There are few diseases in the entire range of medicine in which so much has been done to reduce the mortality as in the affection under notice.

It will be seen, however, that not in drugs, but in skilful nursing, dieting, and other measures, is our faith to be centred. At the outset, it will be recognized that the seige may be a very long one, and arrangements must be made accordingly. Perhaps there is no single factor, or combination of factors, of such vital importance in the treatment of typhoid fever as the *period* or *stage in the disease* at which the case is placed under treatment. The earlier the stage in which the measures about to be described are brought to bear upon the patient the greater is the probability of a successful issue.

The sick-room should be selected by the physician, and it should be quiet, well ventilated, large, and airy, with abundance of light, which can be easily cut off when desired. Where a *very* large room can be obtained, it should be selected, even in winter, and by a few screens placed around, but at a distance from the bed, an agreeable aspect of comfort can be easily produced.

Jenner's plan of having two rooms—one for the night and one for the day—is theoretically a good one, but in practice a dangerous one,

owing to the serious consequences which may arise from moving the patient about. It may, however, be adopted in those cases where two good rooms open directly into each other, the patient and his bed being carried (not rolled) from the one to the other. An upstair room is preferable (this is most desirable in typhus), and the question of having an open fire night and day will be settled by the state of the weather, etc.

There should always be two moderately small beds, of precisely the same height from the floor, so that, when drawn up exactly alongside each other, the patient can be shifted from the one to the other more safely than from one part of a large bed to the other. There is nothing so good as a firm straw palliasse, with a good hair mattress upon the top. A wire mattress instead of the straw palliasse is preferred by some as being cooler, but it lacks in firmness. The bed should be so placed—not in a corner—as to permit of the nurse and physician being able to walk all round it. Everything in the shape of hangings is to be forbidden. The bed-clothing must be light, and it is a good plan to replace the ordinary counterpane by a linen sheet, which can be frequently replaced. Mackintosh sheeting underneath is to be regarded as a very questionable adjuvant.

The services of two good, skilled nurses—one for the day and the other for the night—are to be secured when possible, and it should be insisted that they regularly keep up a written report or journal of the temperature, bowels, doses, nourishment, etc.

In summarizing the effects of different treatments, and in arriving at a conclusion about the advisability of altering any of the details of treatment in a case, it is essential for the physician to have a chart before him giving him a graphic or bird's-eye view of the variations in the temperature, etc.

The patient is to be put to bed at the earliest possible moment, and from thenceforth until convalescence a position of absolute rest is to be maintained throughout his illness. The bed-pan and the urinal must be used always. Cases where perforation, hemorrhage, and death have followed the exertion of the patient's getting up to the night-chair are numerous.

A draw-sheet should be constantly worn, and the most scrupulous cleanliness insisted upon. It is a good plan to have the motions disinfected by some strong antiseptic, as chlorinated lime, terebene, etc., as soon as they are passed. One of these may be placed in the urinal each time before being used.

Diet is of the utmost importance; indeed, except, perhaps, in the case of diabetes, there is no affection in which the question of dietary is of such vital importance, and the young physician must recognize that there is no point in connection with this subject which he can afford to regard as too trivial for his consideration. Few men can be in practice long without being able to testify to the disastrous or fatal consequences which occur from the patient's indiscretion in this matter. A good

rule to have ever before the mind is to forbid every form of food all through the attack, except such as would *readily pass through the meshes of a fine sieve.* Not that it will be necessary to sift any food, but to have clearly before the mind of the patient and nurse that only substances in the liquid form or those containing impalpable powders are admissible.

Milk meets all requirements in the vast majority of patients, and when they can take it, which is nearly always the case, there need be little trouble about the dietary in the early and acute stages of the disease. It is needless to say it should be of the purest and sweetest.

The quantity should, for adults, be not less than three or four pints in the twenty-four hours. Some patients will be found who can take and digest twice this amount, and when very large quantities are taken it may be advisable to skim it occasionally.

The method by which this liquid nourishment is to be administered is of quite as great importance as is the quantity. It must be given in small amounts at short intervals, so as to prevent the patient filling his stomach by a large drink. A wineglassful every hour would represent three pints in the twenty-four hours; but, then, in ordinary cases, the patient should not be disturbed frequently during the night, and therefore double this amount may have to be given during the day and evening. The nurse must, therefore, be permitted to use her discretion according to the individual peculiarities or tastes of the patient, the main idea being adhered to, that, as far as possible, the total amount of nourishment should be as evenly as possible divided over the time. In the early morning the patient generally needs his food most, and in typhoid and typhus fevers, in their advanced stages, the life of the patient may be depending upon the conscientious discharge of the nurse's duty in this particular.

The opposite extreme must be guarded against. There is nothing but injury can follow the administration of quantities of milk beyond the digestive powers of the patient, and the physician by inspecting the motions from time to time can gain valuable information upon this point. It is hard to hit off the requisite amount necessary, but upon the whole it will be better to err *a little* on the side of giving too much. The milk may be given warm, cold, or even iced, to suit any strong inclination on the part of the patient. It will be better to give it iced when possible.

Soda, kali, or plain carbonated water may be mixed with it in varying amounts according to the requirements of the case. It is cruel to refuse an occasional small draught of water or iced water when the patient craves for it, the only objection to this is when water or ice is allowed to take the place of nourishment in patients who have little appetite, as may often be seen in the case of children. One system of treating typhoid fever consists in the administration of large quantities of water with the view of promoting elimination. This should always be kept in mind.

The question of peptonizing the milk is one which must be considered, and it is the opinion of the writer that it is not advisable to adopt this as a routine practice in every case. With patients possessing good digestive powers it is generally unnecessary, and sometimes turns them against the food. An inspection of the motions may settle the question. If much firm curd, or if in liquid motions the undigested flaky coagula are clearly visible, the diet must be altered. Either the patient is not being fed at proper intervals, or he is having more than it is possible for him to be expected to digest, or else his digestive powers are weakened, or else the irritability of the bowel is hurrying its contents too rapidly along the canal to permit of digestion and absorption.

A little reflection will dictate the best course in such cases. Lime-water or kali water may effect the desired change by its action upon the milk. Sometimes a change to beef tea or cold chicken jelly may set matters right, or a little good arrowroot may be boiled with the milk, or a very pure isinglass may be added.

If the patient's vital powers are low the milk may then be peptonized by using Fairchild's powders, or by adding a little liquor pancreaticus. In such a case the question of stimulants will have to come to the front, as will be presently discussed, and if these are indicated the requisite dose of brandy or whiskey may be mixed with the milk before administration. This latter plan often succeeds better than any other, even in those cases where the patient occasionally vomits solid curds.

In cases where milk cannot be taken in sufficient amount, the question of liquid animal food must be considered. Some physicians give beef tea and soups in all cases as a matter of routine. These certainly may be given in typhus always, but in many cases of typhoid fever they excite or increase diarrhœa, and may do harm.

In many cases, and, indeed, in nearly all cases at some period of their progress in typhoid fever, beef tea strengthened by meat extracts and good soups carefully strained are highly advantageous.

The equivalent of one pound of butcher's meat made into good beef tea may be safely given during the twenty-four hours alternately with the doses of milk in most cases from the very beginning, if care be taken to suspend its administration upon the onset of diarrhœa. Constipation is very often present throughout the attack, and it is then that the value of animal soups is most apparent.

The routine dietary of the writer in hospital and private practice is to adhere to milk until constipation declares itself, and then either to suspend the milk entirely for a time, or to give an equal amount of beef tea or strained chicken soup alternately with it. At a later stage an occasional dose of a good mutton broth, carefully strained through a fine sieve and deprived of all fatty matters, will prove a substitute for castor oil or the enema. Raw beef juice and barley and oatmeal gruels well strained are praised by Ziemssen. Calves'-foot jelly and gelatin blanc-mange are admissible, but only in cases where the patient is able to take a sufficient amount of milk or other valuable nourish-

ment. Rennet, with a little carefully prepared currant *jelly* or strained fruit juice, may be permitted.

When any change from the pure milk diet is made the temperature chart is to be closely scanned, and it will be often observed that the rise which sometimes follows can be attributed to the animal food.

Starchy foods are not to be employed except under special circumstances. They do not appear to be digested easily in typhoid fever, and diarrhœa has often been the result. The writer enters a protest against eggs, though their use is advocated by Murchison, Cayley, and others. He has seen them so frequently excite intestinal irritation and favor decomposition or fermentation in the alimentary canal that he has of late years given up their use as a food entirely in all stages of typhoid. In the convalescent period eggs seem to act in the opposite way, and to produce an obstinate constipation. Ziemssen thinks that three eggs *per diem* are enough.

After the subsidence of the fever the physician will be tempted to permit a change in the diet. In contemplating this it will be advisable to summon up the mental picture of the possible state of the ulcerated Peyer's patches and solitary glands. It will be advisable to refuse the patient's request for solid food until ten or twelve days after the normal temperature has been reached.

Boiled white fish is, perhaps, the first solid meat which can be safely permitted, with tea or weak coffee, in which any plain biscuit may be soaked. Ord advises a return to solid food at an early date if the patient clamors for it. He states that he has learned to give in to this strongly stated desire upon the part of the patient for solid food. The writer has not yet learned to do so.

Medicines are of very secondary importance in mild uncomplicated typhoid fever. As yet we do not know of any agent capable of cutting short the attack at any stage of its existence.

Calomel in 10-grain doses was much used, and still is in some places on the Continent in the early stages, with the view of cutting short the disease. Liebermeister gave three or four such doses during the first twenty-four hours, and was satisfied that he caused the attack to abort in a number of cases. The older plan of giving emetics and drastics has been now fairly exploded.

There seems every reason to hope that an agent will be discovered which will be found to cut short the disease. When such discovery is made, it will be probably found to be some well-known remedy used upon a new plan.

Boric acid was tried by the writer as a routine treatment, and it promised very well; but he eventually had to discontinue it in the doses which he hoped would prove useful, owing to its disturbing effect upon the stomach.

Hydrochloric acid in 15 or 20 minim doses, diluted with 1 ounce of water, is the most popular, agreeable, and harmless drug which can be used in the routine treatment of this fever, typhus, or smallpox. It

acts as a febrifuge only by virtue of its effects upon the parched tongue, mouth, and throat, whereby it increases the salivary secretion, and in the stomach supplies an element probably very deficient in febrile conditions. Moreover, it forms an agreeable medium for the administration of other drugs indicated in the various complications which may arise during the course of the disease.

There is scarcely a known antiseptic agent which has not been tried in this disease, from corrosive sublimate or the biniodide down to the carbolic acid compounds, each in its turn earning a short-lived reputation. It would profit little to take up our limited space with a rehearsal of the hopes and disappointments caused by the reports and trials of these so-called abortive specifics.

Alpha-naphthol, naphthalin dioxide, naphthalin, betol or naphtholol, naphthol or beta- or iso-naphthol or hydronaphthol, and several other bodies of this series are still being tried. Dr. Mitchell Clarke brings considerable evidence to show that the best intestinal disinfectant is hydronaphthol, given in doses of 2 or 3 grains in the form of a pill coated with keratin, every two or three hours, or it may be given suspended in milk. Petteruti and others give larger doses—up to 60 grains daily.

Salol is believed to produce intestinal asepsis when given in fair doses.

The antipyretic treatment of typhoid fever is a large subject, and very contradictory views are held by different authorities. The agents employed in this method may be divided into two groups—viz., chemical antipyretics and hydropathy. The former class will be discussed first. It contains a host of agents, and includes all the new and old drugs possessing the power of reducing fever heat, such as quinine, antipyrine, antifebrin, salicylates, phenacetin, carbolic acid, thallin, paracreasotinate, salpyrine, salol, kairin, digitalis, sulphocarbolates.

Before referring to the relative values of any of these agents, it must be stated that there are still some who maintain that the fever heat is conservative, and, if checked, the patient is either injured or the attack prolonged. Though the writer has not seen much to encourage him in the routine employment of antipyretic drugs in typhoid or other continuous fever, nevertheless he is perfectly satisfied that the principle of combating the fever heat is a perfectly sound one. It is only with the imperfections in our present agents that fault is to be found. As soon as a perfectly innocent antipyretic possessing slow but continuous action is discovered, then there may be safely predicted a great drop in the mortality of the continued fevers. Quinine has been long used for this purpose; but for producing a definite and marked depression of fever temperature it is, perhaps, the least reliable of all our agents. It has, nevertheless, great advantages over its new rivals in some respects. Thus its powerfully tonic properties and its slow but more steady and continuous action, when carefully administered, make up for its deficiencies in other respects.

In the writer's hands it has generally failed in satisfactorily reducing the fever heat when this has been very high—*i. e.*, when approaching to 105°, except in the case of children. This experience may be partially accounted for by the fact that he has generally only resorted to it in bad cases, and then it very often fails entirely. Its best effects are to be obtained in conjunction with hydropathy. Less than 30 grains will be of little use, and sometimes the dose may be repeated three or four times in the twenty-four hours without appreciably telling upon the temperature.

At this point it may be well to remark that hyperpyrexia cannot be safely treated by any known antipyretic drug.

There is a group of cases where a moderately high and sustained temperature persists for many days, in which quinine often acts fairly well if given steadily at the rate of 5 grains three or four times a day, for about a week or more. Its good effects may be proved in these cases by suspending it, when the temperature will generally be found to rise again. There can be little doubt that it is beneficial if it be only capable of keeping down the heat steadily for one or two degrees. In the case of children a 5-grain dose often lowers the temperature three or four degrees. It is best given in wafer paper. Upon the whole, however, quinine, as a routine antipyretic remedy, is not very satisfactory, and where the temperature is very high it is useless. Occasionally it excites severe vomiting and distressing cinchonism.

Digitalis is open to the same objections, and also labors under the great disadvantage of proving poisonous when given in large doses; its proper place seems to be when given in combination with moderately large doses of quinine—10 grains of quinine and 30 minims of the tincture.

Antipyrine seldom or never fails to make a very decided impression upon the temperature. The same is also true of antifebrin. By these agents a drop of four or five degrees can be easily and constantly effected. Formerly 30 grains of antipyrine were given, followed by 15 grains in one hour or half an hour, and 15 grains again inside another hour if the temperature had not fallen. By this plan it was not unusual to see a fall of eight or more degrees. Dangerous collapse has often followed these doses, which are now generally abandoned; 10 grains or even 5 grains of antipyrine, or 3 or 4 grains of antifebrin every four, five, or six hours, is the usual method of administering these drugs, and in a few cases the physician may be able to satisfy himself that he can, by this plan, keep the temperature within bounds. He will, however, far more frequently find that after the drop there will be a marked tendency toward a greater rise, and after altering the doses and changing the length of the intervals, he soon begins to find that the depression and profuse sweating, and other untoward effects, produce greater mischief than any good obtained by their antipyretic action.

A very important result, of which the writer has satisfied himself

repeatedly, is the unevenness of the effects of these agents in the same patient during different days of his illness. Thus, a severe typhoid case which bore 20 grains of antipyrine well for several days was almost snuffed out by a 5-grain dose given at a later stage. He has also seen one case in which a single grain of antifebrin would keep the temperature depressed for twenty-four or thirty-six hours, though this patient at first bore moderate doses well.

Where, owing to some passing complication the temperature rises so high as to threaten exhaustion during the middle of a typhoid attack, these agents are of the greatest value in reducing the fever heat and assisting the patient through the additional danger, but in keeping steadily down the temperature for any length of time in a severe continuous high fever, their action is open to doubt. Antifebrin appears to exert a more continuous effect, but the cyanosis and other symptoms which have been so often of late observed are making physicians hesitate to employ it except in small doses.

Phenacetin, salicylates, and the other newer antipyretics do not appear to give any more promising results, but though their action in cutting short the attack is yet to be proved, and their failure in keeping the temperature uniformly reduced is recognized, it cannot be questioned that the employment, when carried out judiciously, of the different members of this class of agents may greatly aid the patient in his struggle against the disease. His general distress may be much relieved, any pain present will be soothed, and sleeplessness may disappear along with headaches and anxiety by their occasional exhibition.

Hydropathy in the routine treatment of typhoid fever has excited great attention of late years. The effects of the cold or tepid bath in reducing the fever heat with certainty, safety, and precision is becoming more and more clearly recognized. In *very severe* cases or in hyperpyrexia there is really no other method of treatment available, as the agents just mentioned are not to be relied upon. About this there cannot be any difference of opinion; but when we come to consider the advisability of employing the cooling bath as a routine agent in all cases of the disease, serious differences of opinion still exist; but it may be truthfully said that under clearer knowledge and more improved methods of administering this agent, and a steadily diminishing rate of mortality, these differences are more or less rapidly disappearing. There are, therefore, many reasons to tempt one to believe that the routine administration of cold or tepid water as an antipyretic will soon become as generally practised as is the rest and liquid diet treatments, except in the very mildest of cases.

The plan first carried out by Brand is still adhered to in bad cases, but for routine use it is variously modified. He places the patient four to eight times a day, after a small dose of stimulant, in a bath of water at a temperature of about 68° F., for fifteen or twenty-five minutes until he feels chilled and begins to shiver. His limit of temperature is 102.2° F. in the rectum. As soon as the thermometer

reaches this height the bath is ordered. When the mercury registers a drop of 2½ degrees he is to be taken out of the bath, wiped dry, and put to bed. Very mild cases will not come under this rule, as the temperature may never reach 102.2°. Liebermeister recommends the routine use of the bath only when a temperature of 103° is reached.

The mortality under Brand's treatment has fallen from 15 or 20 per cent. to 3.9 per cent. Taking all the different reports from favorable and unfavorable reporters, one is safe in saying that the *routine* employment of the cold bath has diminished the mortality by at least 50 per cent.

There are many modifications of Brand's method, and some of these are improvements. It is demonstrated that a *cold* bath is unnecessary, and many have obtained excellent results with water at a temperature from 90° to 95° F. The higher the temperature of the patient the lower should be that of the bath.

Ziemssen highly praises the bath at about 90° F. He advises that the water in it should be constantly stirred, and that the patient's body be wholly immersed in it. It should be gradually cooled down to 80° F. by pouring in cold water at the patient's feet. The duration of the immersion should be over fifteen, but not exceeding thirty minutes. By this plan, which has been much practised, the prejudice against the dangers of cold water is removed and the sensations of the patient are much more pleasant. Shock is avoided.

Always, however, in hyperpyrexia a temperature of about 68° or 70° should be employed, but the very cold or ice bath should be condemned. Ziemssen uses a *warm* bath in adynamic cases.

Under the cool bath the heart beats more vigorously and slowly, and the pulse improves in tension, while appetite and digestion are greatly assisted, but it does not seem that there is any proof that the ulcerative process is altered in the intestinal regions.

Anuschat strongly advises warm baths instead of cold. He insists that it is the water, and not its temperature, which is the most important factor. His baths vary from 95° to 90°, under which last figure he does not go, even if the temperature reaches 105°. He claims that decided improvement sets in in three or four days of treatment. There is almost entire absence of secondary symptoms, and a much shorter duration of illness, 145 out of 150 patients being less than four weeks and many less than three weeks in bed.

Upon the other hand, some physicians insist upon the value of cold affusions very frequently repeated. The writer has resorted to this method when a bath was not available, the patient being enveloped in a thin sheet and cold water poured freely over him.

Barr has employed a tank about 6 × 3 × 1 feet, lined with lead and filled with water varying from 90° to 98°. In this he keeps the patient for a period of one to four or more weeks. A blanket is wrapped round the body, and a pillow to keep the head above water, and a half lid to the tank constitute the machinery for carrying out

this treatment. There is the great difficulty of the bowels, which he permits to be relieved in the bath, the water being made antiseptic. Success has hitherto been the result of this "not very æsthetic" method of treatment.

Simple sponging of the body in detachments has been resorted to by those who believe in the antipyretic treatment, but who are afraid to insist upon the cold bath. The wet pack is even better, and there is no doubt that systematic sponging patiently with cold or tepid water will bring down and keep down the temperature considerably.

The writer's great difficulty in the use of the cold or tepid bath is the movement of the body which it entails. A simple appliance is yet to be devised to obviate this. Every three hours, if the temperature shows a rise up to 102.2° (Brand), or to 103° (Liebermeister), will not be too often for a fifteen-minute immersion through the day and night. Severe hemorrhage and great tympanites or peritonitis, with serious cardiac depression, are the only contra-indications to the use of the bath. The writer thinks that coldness of the extremities should be a contra-indication even when no other sign of cardiac failure is present. Renal complications appear to do well under the baths.

Alcohol. The question of giving stimulants in typhoid and other fevers has been already referred to. There are certain general principles which will meet with almost universal acceptance, while some disputed points will be considered later on. The majority of cases do not require any stimulants at any stage of their progress. The routine practice of administering stimulants in fevers is growing gradually less and less. Seldom, if ever, are they indicated in the early stages of the disease unless in the case of those addicted to their *habitual* or *daily* consumption. A patient who appears to have the indications for alcohol during the first week of his attack will, in all probability, be beyond the influence of remedial agents. The writer does not hesitate to give alcohol when indicated in the way to be presently mentioned, and when he gives it, it is with no sparing hand, but he is decidedly opposed to it as a routine treatment. Statistics, if impartially considered, would seem to prove that the routine use of alcohol and the rigid exclusion of alcohol all round will bring the mortality to about the same thing. This is his belief, and it may be put in two ways—either that alcohol is useless or unnecessary, or that it is at least not injurious, since if it does not lower it does not raise the rate of mortality.

There is, however, another way in which to look at the unanimity of the two classes of statistics which may be nearer the truth, and it is this: Those who stoutly refuse to administer alcohol in all cases will probably lose some lives by withholding it, and those who give alcohol in every case will probably sacrifice some lives by its use. The number influenced will probably be a *very* small percentage of the whole.

Every case must, therefore, be weighed upon its merits, and a decision should only be arrived at after weighing the indications for and against, just in the same way as if opium, or calomel, or antipyrine

were being discussed for administration to meet certain clear indications. The debatable question of giving alcohol as a *food* need hardly be discussed here, though there can scarcely be a doubt that a considerable portion of it is burned or used up in the body just as other foods are. A small percentage of cases may be improved, and the patient's chances of recovery increased by giving small doses of alcohol along with the milk food where there is good reason to believe that the digestive powers are weak, and where close observation proves in the case before the physician that the addition of a teaspoonful of good whiskey or brandy actually does assist the digestion of other nourishment when given along with each dose of it or immediately afterward. There are various indications which are relied upon, as calling for alcohol in severe cases. These are mainly symptoms of cardiac failure, and those who place their faith in alcohol in such cases, do so because, among other actions which it possesses, they believe alcohol to be the best cardiac stimulant.

A weak, unsteady, and easily compressed pulse, and a corresponding condition of the heart, with the typical symptoms of the "typhoid" state, are regarded as clear evidences of the necessity for alcohol. The writer has watched by the bedside the effects of alcohol under these circumstances, and he has satisfied himself that by its use life may sometimes be saved, which, without it, would be lost. The effect of the drug requires the closest watching, and herein lies the secret of success, because it may sometimes be found to do harm in the case where the indications for its use may appear clear, and it is the duty of the physician to give the case his anxious attention for the first six or twelve hours after beginning the alcoholic treatment.

Brunton in his clear and forcible style puts the case so :

"The various rules which have been given for the administration of alcohol in fevers may be condensed into one. If the alcohol tends to bring the patient nearer to his normal condition, it is doing good ; if it takes him further away from the healthy condition, it is doing harm. The points which are usually specially attended to are the condition of the tongue, pulse, respiration, skin, and nervous system.

"If it is found that the alcohol (*a*) renders the dry tongue moist, (*b*) slows and strengthens the pulse when it is too quick, or quickens it when it has become abnormally slow, (*c*) slows the hurried respiration, (*d*) renders the skin cooler or moister when too hot and dry, and (*e*) lessens delirium and brings on sleep—then its action is beneficial. If it have an opposite effect it does harm. Useful indications regarding the advantage of alcohol and the dose may be obtained by the practitioner remaining beside the patient counting the pulse and watching the tongue, respiration, skin, and general condition of the patient for a quarter of an hour after the dose has been given. Particular care should be taken in the administration of alcohol to patients in the small hours of the morning. It is about this time that attendants are most apt to become sleepy, and therefore careless, and just at this time,

also, the external temperature is lowest, the fire is apt to get low, and the vital powers of the patient are most likely to sink."

The question of the dose and form in which the alcoholic stimulant is to be given is an important one. First, as regards the variety of alcohol, the writer believes that brandy or whiskey should always be preferred to wine, and the selection of brandy as against whiskey, or *vice versa*, should be made after considering which of these agents can be procured in the purest form. As a rule, in this country, a pure whiskey is more easily obtainable than a pure brandy, hence, the writer always employs whiskey, and he is satisfied that the product of the patent still should not be employed. The so-called "silent" spirit, and the numerous blends into which it enters, do not produce the cardiac stimulating effects of a matured malt whiskey produced by the old pot-still process. The ethers produced by the splitting up of the traces of fusel oil left in the latter process possess valuable stimulating properties, and, moreover, they appear to aid in the entire combustion of the spirit in the blood. The whiskey can be given to the greatest advantage along with the milk, when the patient does not object to this plan.

As regards the dose, the symptoms and their severity, and the ascertained effects of the agent, must be taken into account along with the previous history of the patient.

The practice of the writer is only to give alcohol when clearly and urgently needed. Hence the dose which he generally employs will appear larger than that usually recommended. Two or three ounces in the twenty-four hours, as often mentioned by writers, can be of no use in severe cases, and in mild cases the patient will probably be as well or better without them. The only value that can come of such a small quantity is that already mentioned, *i. e.*, to aid in the digestion of the liquid nourishment.

Less than 5 ounces of old whiskey spread evenly over the twenty-four hours will be of little use to an adult in the condition indicating the exhibition of alcohol. In bad examples of the typhoid state, with a very fluttering pulse, dry tongue, and mouth covered with sordes, the writer has given twice and sometimes three times this quantity with the greatest benefit.

Wood states "that, properly administered, it always promotes, not arrests, secretion in these cases. The guide to the amount given should be the effects produced; so long as it lowers the temperature and pulse rate, moistens the dry tongue and skin, and quiets the nervous disturbance, it does good. If, however, the tongue grows drier, the pulse puts on an angry, bounding character, and the patient becomes restless and uneasy, stimulation is being pushed too far, and the amount exhibited should be lessened. Whenever the *odor* of liquor *appears upon the breath* the patient is almost certainly *taking too much*."

Large doses of alcohol have a lowering effect upon the temperature,

but it is out of the question to think of using it merely for this purpose in typhoid fever. Where the cold or tepid water bath is being used, a small amount of alcohol is considered necessary, and there is no reason why alcohol, quinine, and the tepid bath may not be all indicated in the same case.

Where complications exist, the choice of the form of alcohol may be determined by the nature of the symptoms present. Thus, where stimulants are indicated and the patient is vomiting, champagne may be selected instead of either brandy or whiskey, and if diarrhœa is a marked feature, the effects of a good old port wine may be tried.

Where the stimulant cannot be given mixed with the food, it should be administered in a very diluted form.

The writer, in the last edition of his work on *Materia Medica and Therapeutics*, thus sums up the alcohol question in fevers: Most authorities, however, would probably agree (1) that alcohol is not necessary at all in the *majority* of cases; (2) that often unpromising cases pull through without it; (3) that in severe cases it cannot be safely withheld from those habituated to it; (4) that occasionally by the use of alcohol life may be saved which would otherwise be lost; and (5) that it is rarely needed in the very large doses prescribed by some—6 to 10 ounces of whiskey may be regarded as representing a liberal daily allowance.

Such, then, will be the routine treatment of typhoid fever, but complications must be met. They are the rule, a case without them being the exception. The management of the complications will now be briefly detailed.

Sleeplessness. This may prove a troublesome symptom in the disease from the earliest stage, and any of the usual hypnotics mentioned under Insomnia may be employed. The writer prefers a draught like the following:

℞.—Morphinæ hydrochlor.		gr. ss.
Sodii bromidi		gr. xlv.
Syr. aurantii		ʒiij.
Aquæ camphoræ	 ad	℥ij.—M.

S.—The half to be taken at bedtime, and the remainder in three hours if necessary.

Where the sleeplessness depends upon headache, this should be relieved, if possible, first, and in such a case morphine or opium may aggravate it (see below). Chloral is a favorite drug with some physicians, The writer never uses it unless all others fail, and this is very seldom. In the late stages of this disease, or even more so of typhus, it is a dangerous agent, owing to the fatty degeneration of the heart which for a time follows all prolonged high temperatures.

Sulphonal acts very well, but it should be given in *solution*. It can

be easily dissolved in a large quantity of boiling water, and given when partially cold with a little stimulant.

The watery extract of opium or the tincture may be selected where we have a relaxed condition of the bowel as well as insomnia.

HEADACHE. This is sometimes violent in bad cases at the beginning, and the following measures are those used by the writer: A mustard plaster behind the upper part of the neck and over the occiput, extending upon the sides as far as the back of the ears. A moderate dose (15 grains) of antipyrine repeated in one or two hours. If relief be not marked, clipping or shaving of the hair, and the ice-cap, or Leiter's tubes, and in very bad cases leeches may be applied to the temples. This will seldom be necessary, except in those *rare* cases beginning like acute mania.

The cold pack or bath, or tepid bath, if the temperature be very high, generally gives speedy relief. Quinine often aggravates.

DELIRIUM will, as a rule, yield to the same remedies as the headache in the early stages of the disease. Absolute quiet and darkness will aid the above-mentioned drugs. At a later stage the cause of the delirium must be sought for and remedied, when possible. Thus, it may be the first sign of a pneumonia, meningitis, or even an intestinal hemorrhage or renal complication. The writer has seen it yield to the emptying of an enormously distended bladder which had been overlooked. Coma is to be similarly dealt with. The treatment of the typical typhoid state has already been referred to, the main agent being large doses of alcohol. In one case, where the delirium and coma of typhoid fever rendered the patient's condition hopeless, the writer saved life by pouring in large quantities (1 ounce every hour) of whiskey through the tube of a feeding-cup placed far back upon the root of the tongue, the power of swallowing being almost lost.

Musk in 3 grain doses may be given in such cases, and if the temperature is high, the cold bath after a hypodermic injection of ether or a rectal dose of alcohol should be tried. Cold affusion sometimes is very valuable in such cases if applied when the patient is lying in the tepid bath.

DIARRHŒA should not be interfered with unless the number of motions exceed four in the day, and not then if they be not large in amount and very watery. A careful inspection of the motions should be made in such cases, and, by a change in the feeding, the bowel irritation may be stopped. Undigested curd of milk or too much beef tea or soup may be the cause. The writer has seen the dilute hydrochloric acid mixture, as ordinarily given, produce diarrhœa. Peptonizing of the milk, or the addition of whiskey or brandy, and the withdrawal of all meat extracts and starchy foods, may at once check it. Arrowroot boiled in milk, and made very thin, so as to be taken as a drink, may be tried before drugs. It is the only starchy food admissible.

Opium, to relieve the exalted peristalsis of the bowel, is the most reliable drug. With it may be combined some agent to effect intestinal

antisepsis. Though the writer has never tried naphthol, he is prepared to believe that when some method is discovered by which it can be given without upsetting the digestion, an advance in the therapeutics of typhoid fever will be recorded.

The best form for the administration of opium is an enema of starch, of creamy consistence, not exceeding the capacity of a wineglassful, along with 30 minims of laudanum.

Where there is irritability of the rectum, 20 minims of laudanum may be given every three hours or oftener by the mouth, and where vomiting occurs, the $\frac{1}{16}$ grain of morphine perule may be given.

The following is a favorite hospital routine mixture for the diarrhœa of typhoid:

℞.—Acid. sulphuric. aromat. ℥j.
Tinct. opii ℥ijss.
Tinct. catechu comp. ℥iv.
Aquæ camphoræ ad ℥x.—M.

S.—Two tablespoonfuls to be taken three times a day or after every loose motion.

In very obstinate diarrhœa, lead may be given combined with the opium, 2 or 3 grains of the acetate and 10 minims of laudanum after every loose motion. Tannin, logwood, chalk mixture, rhatany, etc., and the host of astringents mentioned under Diarrhœa, upon page 190, have been given. Opium is by far the most reliable of them all.

Hot enemata are highly recommended by Geissler, who gives 20 ounces of water at a temperature of 108.5°, and reports that the number of stools are lessened and rendered less mucoid. Teissler, of Lyons, employs a cold enema every six hours. Other authorities go in for washing out the colon with various antiseptic solutions, but this is a practice not to be commended with our present knowledge.

Constipation is often as troublesome as diarrhœa. After trying every method, the writer finds that where beef-tea and meat-soup diet is not sufficient to keep the bowels right, a glycerin suppository is very satisfactory. It can be given without any difficulty, and generally acts in a short time. Where it fails, a warm water enema may be given, and repeated as often as is necessary.

Drastics and all cathartics are strictly forbidden. The only aperient which is safe is castor oil, and the dose of this should not exceed 2 drachms at the outside. It should not be given, if the constipation has lasted many days, until the rectum is washed out by a large olive oil and warm water enema. Eggs are not to be administered, as they tend to increase the constipation.

Hemorrhage is a very formidable complication, and there is not any drug so valuable as opium. In severe cases 40 minims of laudanum may be given by the mouth, and if there be any vomiting present, a hypodermic injection of morphine should be given without

delay. The nurse should manage to give as little disturbance to the patient as possible in the use of the bed-pan; in some cases life may depend upon such absolute rest that even this appendage must be dispensed with, napkins and other appliances being used for the time. Cold to the abdomen should be tried. The large ice-bag is too heavy. A napkin laid in two folds over the abdomen with small pieces of ice between answers all purposes.

In severe cases food by the mouth is to be almost stopped, life being sustained by minute doses of concentrated beef essences, given at considerable intervals, with small pieces of ice between, and the regular administration of small peptonized enemata of strong beef tea, to each of which a few minims of laudanum may be added. Iced enemata are recommended, but they do more harm than good in some cases.

Where opium and the above measures fail, the hæmostatic class of drugs may be tried. Dr. J. S. Reid, whose experience of this disease is very great, places his reliance upon alum in full doses, given by the mouth. Ergot, lead, tannin, chloride of iron, iron alum, logwood, sulphuric acid, turpentine, and every known astringent has been tried. (See the relative values of these discussed under Hæmoptysis, Hemorrhage, etc.

Stimulants should be partly suspended, only enough being given of food and alcohol as will keep the patient alive until in the period of dead low water the open vessel has been sealed up by a coagulum.

Perforation can only be met by the most rigid rest and large doses of opium, so as to border upon slight coma, cold to the abdomen, and the maintenance of life by small peptonized enemata, and a very few bits of ice sucked in the mouth. If good nutrient suppositories are at hand they would be indicated. There must be no movement of the patient's body made in administering the enemata. His faint chance for life depends upon starvation, rest, and opium. This latter is to be given by the rectum or hypodermically.

Peritonitis is to be treated upon the same lines—rest and opium. Cold applications are, as a rule, not so well borne as warm ones, and the best plan is spongio-piline soaked in hot water and kept in place by a light bandage. Poultices are generally, unless very skilfully made, too weighty.

Bedsores should be prevented by careful nursing. When they have occurred they must be treated by absolute cleanliness and the applications detailed under Bedsores, page 65.

Retention of urine can only be met by catheterization, and the soft rubber catheter should always be employed. Where the urine is ammoniacal the bladder may be washed out by some antiseptic solution, or, better still, by adding 20 grains of boric acid to the day's supply of milk.

Miscarriage, pneumonia, albuminuria, and other complications are to be treated upon general principles, keeping in mind the indications for the various drugs mentioned under the heading of the complication.

During convalescence the greatest care is to be exercised regarding diet and locomotion. Every time solid or animal food is administered, for the first few days the range of temperature is to be carefully watched and a return to liquid food insisted upon if any substantial rise occurs. It is almost a universal mistake to prolong the administration of alcoholic stimulants too far into the convalescent period. The patient should not be permitted to leave his bed for twelve or fourteen days after the temperature has fallen to the normal. Some physicians begin drugging with tonics, but these are seldom necessary. The writer feels that the following summary of the treatment of typhoid fever is well worth repeating; it is from an able address delivered by Bristowe in 1880:

"In conclusion, gentlemen, let me state briefly the treatment to which I should like to be subjected if ever, unfortunately, I should become affected with enteric fever. I should like to be placed in a cool, well-ventilated room and covered lightly with bedclothes, and to have a skilful and attentive nurse to look after me; to be fed solely with cold milk, unless vomiting should demand the addition to the milk of medicine calculated to allay vomiting. If diarrhœa became troublesome, or ever there was much pain or tenderness in the cæcal rings and in the bowels, I should like to be treated not with laxatives, but with opium, given ether by the mouth or by the rectum. If constipation were present I should, excepting in the first week, like to have enemata only employed for its relief. In the event of intestinal hemorrhage coming on, I should like to have ice to suck, or ice-cold fluids to drink, cold compresses to the belly, and cold injections into the bowels; and, though I am sceptical as to their efficacy, I should still chose to have astringents, and more especially lead, given to me at short intervals. If perforation should take place, let me have large and repeated doses of opium. Stimulants I should prefer to do without early in the disease; later, however, and during convalescence, I should like to have them in moderation. As to the cold baths, I would rather not have them, but I would nevertheless leave it to my physician to exercise his discretion in the matter. I would leave it also for him to decide, according to circumstances, whether alcohol should be administered to me in large quantities. I would prefer not to be treated at a temperance hospital."

TYPHUS FEVER.

The previous article upon the treatment of typhoid fever, in most of its details applies to the treatment of typhus.

The chief omission required will be the management of the complications, which of course do not happen in typhus.

The selection of the sick-room is detailed upon page 860, and the general directions regarding nursing, etc., are identical. This fever being highly contagious, the sick-room must be most completely cut

off from the rest of the house; and it is held that, owing to the supposed nature of the contagion, the room should be at the top of the house or that no occupied rooms should be situated above it.

Where there are many inmates in the house and where the air-space is limited, the wisdom of treating a disease which spreads alarmingly in over-crowded situations is more than doubtful. In the case of schools and public institutions it should not be attempted, removal being considered essential.

It is almost as important as in typhoid fever to insist that the patient takes to bed immediately.

Food is to be the same as in the case of typhoid. Though there are not the same urgent necessities for a purely liquid nourishment, owing to the absence of bowel ulceration, nevertheless the great advantages of a purely liquid dietary are so well recognized that every detail applying to typhoid fever in this respect holds here equally well. More beef tea and chicken or other soup can be given, as there is not the same danger of exciting diarrhœa, and it is a good plan to give milk and beef tea alternately in most cases where the patient takes to this method.

The question of alcohol as discussed under typhoid exactly applies here. The stimulants may, however, be commenced at an earlier date; and speaking generally the writer would say that, in his experience, there is more need of alcohol and more good to be expected from it in typhus than in typhoid fever. All old patients require it, but children very seldom do. Some epidemics of typhus are characterized by such depression that alcohol may be indicated in nearly every case. The dose may reach 15 or even 20 ounces of whiskey in the twenty-four hours. The key-note to the use of alcohol, antipyretics, and baths lies in this one consideration—that the siege, though a severe one, will be almost certain to last only fourteen days, and the entire effort and one thought of the physician should be, not to fight the disease with the view of exterminating it, but to try by a purely expectant method to keep the patient alive until the expiration of that time. In some cases within sight of the goal, life may be sustained upon stimulants when all else fails, but it must ever be remembered that life can be sustained upon stimulants for a very short time only.

The remarks about antipyretics apply equally to typhus and typhoid, with this difference, that, as we know how long the attack is to last, we can the better judge of the necessity for their administration.

Chemical antipyretics have not yet been proved to be of any real service, and the value of the cold or tepid bath is not yet established in the same way as in typhoid as a routine element in the treatment. The occasional use of the bath is beyond doubt of the greatest value when the temperature is high; but the writer thinks that its routine employment should not be commenced until the temperature reaches

at least 103° Quinine may be used at the same time in some cases with advantage. The bath is the only reliable agent for hyperpyrexia in this as in other diseases. As in typhoid, the internal administration of 15 or 20 minim doses of the dilute muriatic acid is the best simple routine procedure.

Delirium, headache, and sleeplessness may be met by ice to the head and counter-irritation to the nape of the neck. Some authorities blister the forehead or scalp in such cases. As a hypnotic, chloral may be used in conjunction with large doses of bromides; but at a late stage it should not be given on account of the weak heart which is often an element of typhus. Opium cannot be borne when the headache and delirium are marked, unless when given, as advised by Graves, along with moderate doses of tartar emetic.

The new hypnotics may be tried with advantage. Cold sponging is admissible in all cases.

Coma must be promptly met by cold affusion, if the temperature is high, or by rectal injections of strong coffee or by coffee by the mouth, if the stupor is not complete. Murchison laid stress upon the necessity for counter-irritation over the loins with cupping-glasses or sinapisms covered by mackintosh, in deep stupor, and he blistered the scalp by strong ammonia in some cases. The writer would recommend the hot blanket bath under such circumstances, and the general treatment for acute uræmia mentioned upon page 73, if albumin is found in the urine and the temperature be not high.

Owing to the blurred mental condition of the patient his bladder must be carefully watched, and the soft rubber catheter passed as often as needed. Food must be, for the same reason, regularly forced upon him, and his position changed from time to time as he lies in bed, to avoid hypostatic congestion.

Pneumonia must be met by free stimulation, counter-irritation, and the internal administration of ammonia in full doses. If the typhoid state be present, ammonia should not be given; then full doses of turpentine, with a little ether and cajuput, are admissible. The glycerin of borax (1 : 5) should be applied to the tongue and mouth frequently, and bits of ice and small but frequent draughts of iced water may be given all through the disease.

The patient often fails to ask for water, but the nurse should see that he gets it as regularly as his nourishment and stimulants. Free elimination is of vital moment, and water is too often withheld.

After the fall in the temperature rapid convalescence begins. The stimulants should be lessened after the first twenty-four or thirty-six hours, and in three or four days almost stopped. By that time the appetite has improved, and semi-solids, as farinaceous foods, fish, chicken, oysters, etc., may be given inside a week from the fall in the fever heat. The following tonic is useful at this stage:

℞.—Quininæ sulph. ℥ss.
Acid. nitrohydrochlor. dil. ℥iv.
Tinct. calumbæ } āā ℥v.
Tinct. quassiæ }
Inf. aurantii ad ℥viij.—M.

S.—A tablespoonful in a wineglassful of water three times a day, before meals.

ULCER.

Under Gastric Ulcer, page 273, the treatment of ulceration of the stomach is detailed.

Under Anus, page 46, the treatment of ulcer of the anus or rectum will be found.

Rodent Ulcer, page 763, will give the remedial procedures for that affection.

The treatment of ulcers of the mouth are described under Stomatitis and Tongue, on pages 785, 51, and 843.

Lupoid, scrofulous, and syphilitic ulcerations are detailed under their appropriate headings.

Perforating Ulcer of the Foot is mentioned under its own heading, upon page 597.

The treatment of the various ulcers almost necessitates a description of each, so many varieties have been named, and the same words are used in different senses by different writers. The writer will describe the treatment of the *healthy*, *healing*, or *simple cutaneous* sore, which, in the vast majority of cases, is found upon the lower half or two-thirds of the leg in adults. At different stages of its progress such a sore may vary considerably in character, and by changes in the patient's health, or by injuries, or by prolonged exercise, etc., the healing ulcer may become an "inflamed," "irritable," "weak," "sloughing," "indolent," or "eczematous" sore.

The treatment of the *healthy* or *simple cutaneous* sore or ulcer is, for the most part, easy. Rest and the application of almost any moist dressing will speedily assist healing.

Rest is the main element in treatment, but it is not easily obtained in most cases. Few people will take to bed for the sake of healing a small sore which is giving little trouble. Almost all the advantages of a prolonged rest in bed may be obtained through the application of an even elastic pressure. The introduction of the Martin's India-rubber bandage has wrought a revolution in the treatment of ulcers, and though its application is not essential for the healing of a simple ulcer, nevertheless in most cases it will greatly expedite it. Should the ulcer become chronic, its use is essential. There is a serious objection to the rubber bandage which maintains in many cases, and it is the liability of the retained secretion of the skin setting up a general eczematous condition of the entire limb. This may become

a serious matter. Hence the writer uses a modification of the bandage for most cases of ulcer of the legs, which he treats in the following routine manner:

A double ply of lint is neatly cut out with scissors to the shape and size of the ulcerated surface. A piece of oiled silk, half an inch larger every way, also is prepared. The lint is soaked in ordinary carbolic lotion (1 : 40), laid upon the sore, and covered over with the oiled silk. Where there is any tendency to eczema, the skin around the edges of the ulcer, where in contact with the oiled silk, may be smeared over with a little lard, vaseline, or any stiff emollient ointment. This prevents irritation by the retained secretion under the oiled silk. Over the lint and oiled silk a woven rubber bandage, about three and a half inches wide (such a bandage as is used for Esmarch's bloodless operation), is applied evenly from the toes up. This bandage is manufactured in the same way as the elastic spring-sides of ordinary boots, and it is known as "elastic webbing." It should be taken off when the patient retires to bed, and put on before he gets up in the morning, any ordinary bandage being used to keep the dressing in its place during the night.

Instead of the carbolic lotion, any of the following lotions may be used from time to time, according to the appearance presented by the sore—*i. e.*, cold water, spirit lotion (1 : 4), chlorate of potassium (4 grains to 1 ounce), chloride of zinc (2 grains to 1 ounce), liquor plumbi (15 minims to 1 ounce), black wash, yellow wash, corrosive sublimate (¼ grain to 1 ounce), chloral hydrate (3 grains to 1 ounce), acid. nitric. dil. (5 minims to 1 ounce), tincture of benzoin, hazeline, iodine (1 grain to 10 ounces), sulphate or nitrate of copper (1 grain to 1 ounce), nitrate of silver (5 grains to 1 ounce), boric acid (10–20 grains to 1 ounce), etc.

Where any watery solution seems to irritate, an oily solution like carbolic oil (1 : 15), or almost any of the above-named substances made into an ointment with lard, spermaceti, or zinc ointments, or any of the following U. S. P. ointments: Diachylon, iodoform, lead carbonate, carbolic acid, or oleate of zinc may be employed.

When a greasy application is made it is better, as a rule, not to cover it in with oiled silk, though the carbolic oil does admirably when so applied.

The dressing may be applied twice daily, and if a liquid application has been used, a stream of tepid water should be passed over the face of the ulcer to wash away all secretion before the fresh lint is applied. When ointments or oils are used, the ulcer should be lightly cleansed by gentle wiping with cotton.

Simple ulcers often heal rapidly by placing a piece of sheet-lead or thick lead-foil over the dressing. The writer has seen excellent results from the lead being laid directly upon the sore without the intervention of any dressing.

Weak ulcers are those in which there are abundant flabby, pale, or watery-looking granulations. This condition may to a certain extent

supervene upon the healing ulcer, but it more frequently exists from the first, and is a strong indication for cod-liver oil and iron, pure air, and extra feeding. The local treatment may be summed up in a word—stimulation. The best of all remedies is the solid stick of nitrate of silver pencilled over the œdematous granulations, followed by a dressing of dry lint under a suitable elastic bandage.

At a later stage the sore may be rubbed over every two or three days with a large crystal of sulphate of copper. The best dressing is the diluted nitric acid lotion or a weak solution of sulphate of copper or of nitrate of silver.

To apply a piece of lint upon the sore which has been saturated in the tinct. benzoin comp., and cover over with lead-foil and a bandage, is an excellent method of dealing with this variety of sore.

The unguentum resinæ is a valuable dressing for this and the following form of ulcer:

The typical *indolent* ulcer goes by many names, and an infinite variety of treatments has been recommended for it. Stimulation must here be severe; the application of the solid nitrate of silver seldom succeeds except in very mild cases. When possible, the patient should lie up, so as to get the treatment well started. The first step in treatment is to thoroughly cleanse the often foul, greenish-colored watery surface, and get rid of every trace of dead matter by carbolic or corrosive sublimate in very weak solution. Poultices, so often recommended, are not to be applied; much more will be obtained by antiseptics under oiled silk, and very frequent and very thorough bathing.

The edges in all chronic cases are raised and callous and of almost cartilaginous consistence, so that this type of sore is often called the *callous* ulcer. As long as these edges remain in this condition recovery or healing is not possible.

Before resorting to severe measures *pressure* may be tried, and sometimes, even in most unpromising cases, the skilful use of the Martin's India-rubber bandage acts like a charm. It may be applied direct to the face of the ulcer without any intervening dressing. The patient should apply it himself every morning before leaving bed, and he soon gets to feel the requisite amount of tension, which increases as he assumes the vertical position. The bandage is kept on all day and not removed until the patient is flat in bed. It is then washed in a basin of water containing a trace of some antiseptic. The ulcer is to be likewise carefully cleansed, and a thick pad of lint soaked in spirit or carbolic lotion placed over it until morning under a plain calico or stocking-web bandage. The skin of the limb is generally found so macerated and tender that it will not be advisable to cover in the night lotion by oiled silk, though this may sometimes be done to advantage.

Sheet-lead, cut a little larger than the ulcer, may be laid over one or more plies of lint soaked in weak corrosive sublimate or any other lotion and placed upon the surface of the ulcer, the whole being covered by a pad of lint or gauze and kept in position by elastic webbing

or woven India-rubber bandage as just described. Excellent results follow this method where the pure rubber bandage cannot be tolerated.

Watson, of Boston, modifies this plan by laying a piece of protective over the face of the sore after thoroughly disinfecting it with a 1 : 4000 corrosive sublimate solution; over this he places a piece of sheet tin, the whole covered by a dry corrosive sublimate gauze dressing held in place by an evenly applied bandage from the toes to the knee. The lead-foil and woven-rubber bandage are better. Where these plans fail after a good trial, during which the patient may be permitted to follow his avocation (this is the great value of the method), other measures may be tried.

Blistering of the ulcer and its margins is recommended, but this is a painful and often useless plan and may possibly cause sloughing.

The best treatment at this stage is to take a sharp bistoury and make a series of alternately deep and shallow linear incisions through the thickened or callous margins, radiating outward from the centre of the ulcer like the spokes of a wheel from the nave. The deep incisions should penetrate the deep fascia and extend for an inch or two beyond the margins of the ulcer. Bleeding is easily stopped by pressure. This method is more successful than paring down the edges of the sore. The writer thinks it was first practised in the Edinburgh School, and he has seen its great success in many cases in the hands of an old pupil of Syme.

Harbordt, apparently independently, has introduced a slight modification of this method, which is thus described by Spaeth:

"The entire ulcer is divided lengthwise by a deep incision, extending far into the healthy tissue. Cross incisions are then made through the callous tissue into the healthy at intervals of about three-quarters of an inch. The incisions must go through, not only the skin, but the underlying fascia; the wounds must gape widely. The bleeding, often profuse, must be stopped with tampons; and the whole wound, which it must be owned has rather a slaughter-house look, is done up with iodoform dressings. When, after eight to fourteen days, the dressing is changed, the difference in appearance is very marked. Healthy granulations are springing up in abundance from the gaping incisions, and soon cover the whole surface reaching the level of the surrounding skin from which the growth of new epidermis is seen to advance rapidly."

Scraping of the ulcer may be tried before resorting to this procedure in some cases, where the edges are not very thick and raised.

Strapping of the ulcer should be mentioned. It is, however, seldom needed now, as all that it can possibly do is better done by the elastic pressure of Martin's bandage.

Skin grafting may be needed where the ulcer is extensive, but it is useless to attempt the operation until the entire nature of the sore has been first altered by some of the above plans. Sponge grafting has very often failed. The skin grafts should be very small. Though

they may be numerous, they do best when planted inside the edges of the sore.

Unna's treatment of chronic ulcers of the leg is applicable to the simple, indolent, and varicose forms. The leg is washed with soap and water and covered over everywhere, except at the ulcerated spot, by a paste consisting of 1 part of pure gelatin, 1 part of oxide of zinc, 4 parts of glycerin, and 4 parts of water. Iodoform is then freely sprinkled over the ulcer, which is afterward to be covered with any antiseptic gauze laid over a layer of cotton-wool. Over all are applied two double-headed wet mull bandages with their ends crossing in front. They should extend from the middle of the foot to the calf. Once or twice a week will be in the majority of cases sufficiently often for changing the dressings, but when the discharge is profuse this may be necessary every second or third day. Hildebrand, who has obtained excellent results from this method, claims for it that it draws the healthy skin toward the ulcerated margins and rapidly facilitates healing.

Electricity may be utilized in various ways for the healing of very chronic ulcers; the most convenient and simple plan is that devised by Bird, and described upon page 66. He covers over the ulcerated spot with a disc of silver, attached to a plate of zinc by means of a wire. The zinc disc is placed over the neighboring skin from which it is separated by a layer of wash-leather, soaked in vinegar.

Papain has been used to cause disintegration of the thickened edges of very chronic ulcers, and several surgeons have tried to establish healing by inducing inflammation by means of jequirity infusion or a paste (1 : 4) of the powdered seeds, but, as a rule, the results have been unsatisfactory.

The writer has seen very decided benefits follow the fumigation of the ulcer by means of calomel vapor. In *syphilitic* ulcers this appears to act sometimes like magic, but in nearly all forms and varieties of chronic ulcer its benefits are most striking. The patient lies in bed, and the calomel is put into the receptacle in the apparatus used for giving a hot-air bath in Bright's disease (this is briefly described upon page 74), and the calomel vapor is conducted under the bed-clothes by a narrow tin tube whose extremity is placed immediately opposite the ulcerated surface.

Where all plans fail, and the ulcerated surface has been permitted to involve a large area of the leg surface, amputation may be the only alternative to a bed-ridden career.

In such cases Bell Keatley's operation is a distinct advance. He scrapes the ulcer thoroughly, removes the bones and soft tissues of the dorsum of the foot, and transfers to the site of the ulcer the whole of the sole of the foot, including muscles, plantar vessels, and nerves, and excluding loose tendons after removing a small portion of the lower end of the tibia. The result is a good stump, like a Syme, instead of an ordinary amputation at the knee. He also preserves the dorsal foot flap for ankle amputations in cases of *complete circular ulcer of the leg*

by bending it round upon its neck and covering with it the ulcerated surface. (See *Lancet*, November, 1885, and February, 1890.

It must always be kept in mind that, though the local treatment of the indolent ulcer is most important, little advance can be made unless constitutional measures be closely attended to. This is true also as regards all forms of chronic sore. Healing may be impossible until good food in abundance, with tonics, pure air, and every means by which the nutrition of the body can be improved, have got a fair trial.

The *irritable* and the *inflamed* ulcer are often very difficult to deal with, and the measures already mentioned are contra-indicated until all pain and tenderness are removed, as stimulating lotions or ointments, or the pressure of the rubber bandage, will only aggravate the patient's suffering.

Absolute rest in the horizontal position is essential. Generally the administration of purgatives affords some relief, and the effect of half a minim of croton oil is often very striking; it appears to possess some specific action over the irritable ulcer.

The writer has seen the pain and discomfort associated with the irritable ulcer yield rapidly to the following pill, which is a modification of Plummer's pill:

℞.—Hydrarg. chlor. mitis gr. jss.
Antimonii sulphurati gr. ij.
Resinæ guaiaci gr. ij.
Olei tiglii ♏ ⅓.—M.
Make 24 of these.

S.—Take one pill every night and morning for three days, then one occasionally.

Saline purgatives are to be preferred in the case of the inflamed ulcer where there is much pain, heat, redness, and swelling in its margins.

Constitutional remedies for the relief of pain may be indicated, but, as a rule, opium and other narcotics are not to be employed except to produce sleep at bed-time. A combination of bromide of sodium (30 grains) and antipyrine (5–10 grains) may be given two or three times a day when the pain continues to disturb the patient.

Locally the irritable ulcer may be best treated by carbolic lotion (1 : 30) under oiled silk. When this fails, 2 per cent. cocaine solution may be tried. If this latter does not give immediate relief it may be rejected, and a lotion of chloral hydrate (1 : 200) may get a trial. The old lead and opium lotion under oiled silk may do well, but very often every sedative application appears only to aggravate the pain. Under these circumstances by far the best plan to pursue is to apply a strong solution of cocaine (8 per cent.) for fifteen minutes, after which the ulcer and its edges are to be well painted over with the strongest solution of nitrate of silver (60 or 80 grains to 1 ounce), or the solid

stick may be used. After cauterization, soothing evaporating lotions may be used for a few days, when the ulcer may be regarded as a simple sore, and treated by the agents already enumerated.

The inflamed ulcer is best dealt with by cold evaporating lotions and the elevation of the limb after saline purgatives have been used to establish a free discharge from the bowels. A few small incisions with a sharp-pointed tenotomy knife will give better results than leeching, and in very severe cases one poultice may be applied to encourage the bleeding from the incisions, but poulticing, as a rule, is bad practice in the treatment of ulcers.

Sloughing ulcers call for supporting and stimulating constitutional treatment. They occur in intemperate and often in syphilitic subjects, and the agents indicated in phagedæna may be demanded. Thus opium, alcohol, tonics, concentrated beef essences and jellies must be given freely.

Local treatment will depend upon the peculiarities of the case. Thus, if the sloughing process seems to be spreading, a free application of the strong nitric acid may be demanded, but if the process appears to be at a standstill, measures which hasten the separation of the slough will be indicated. Weak antiseptic lotions, as corrosive sublimate (1 : 5000), permanganate of potassium (1 : 1000), nitric acid (1 : 3000), or carbolic acid (1 : 60), may be used to irrigate the sore and its immediate vicinity.

After constitutional measures have been used, and the patient's general condition improved, the ordinary applications suitable for a simple healing ulcer may be employed.

Varicose ulcers are those occurring upon the limbs, the seat of a varicose or enlarged condition of the veins. The term is a bad one, as any form of ulcer may be and generally is classed as varicose when occurring under these circumstances. The appearance of the sore will give indications for the employment of some of the previously mentioned plans of treatment. As a rule, however, little progress will be made unless the condition of the veins is specially attended to. Rest is essential, and, if the ulcer be not irritable, this may be accomplished without sending the patient to bed if a good rubber bandage can be worn during the day-time.

Many therapeutists still believe that hazeline or hamamelis exerts some specific action upon the coats of veins, and hence a lotion consisting of equal parts of hazeline and water is a favorite application to the so-called varicose ulcer. The writer uses the Martin's bandage, applied directly to the limb, during the day, and the following lotion at night under oiled silk:

℞.—Spt. vini rectif. ℥ij.
Hazelini ℥iv.
Aquæ rosæ ℥ij.—M.

S.—To be applied to the sore spot upon lint and covered over with oiled silk.

Eczematous ulcers are generally a variety of the last mentioned, as they are nearly always associated with varicose veins. Their treatment is often very troublesome, and will depend upon the stage of the eczema present. If the case is of long standing and the eczema be scaly, the rubber bandage may be tried cautiously. If the patient can tolerate it without uneasiness, it may be found to remedy the three abnormal conditions at the same time—viz., the varicose veins, the ulcer, and the eczema. Unfortunately, however, it will be found sometimes to increase the eczema by preventing the escape of the secretions of the skin and of the ulcer. Two courses will then be open —either to send the patient to bed and treat the eczema and ulcer, or to resort to the *woven rubber* bandage described upon page 879. Under this appliance any suitable eczema remedy may be applied to the limb, while the patient is permitted to pursue his ordinary avocation.

As a rule, in the eczematous ulcer, moist applications under oiled silk should be avoided. Under the woven rubber bandage, powders like oxide of zinc, starch, bismuth, etc., can be applied if there be much secretion; or stimulating ointments like tar, basilicon, or the valuable combination given in the recipe upon page 229, may be spread upon lint and laid in contact with the sore.

The rubber bandage should be always worn after the healing of the ulcer, or the veins may afterward be tied and cut, so as to radically remedy the varicose condition.

URINARY FISTULA.

As this condition is generally a sequel to stricture of the urethra, abscess of the prostate gland, or extravasation of urine from traumatic causes, the treatment of the primary condition will call for surgical interference.

The affection varies widely in different cases owing to the route taken by the original urinary abscess. Thus only one sinus about the scrotum or perineum may exist, while as many as thirty openings have been seen studded over the same region and extending into the rectum and above the groins. The treatment will, therefore, necessarily vary considerably.

Given a simple fistula, opening at the one extremity into the urethra, and at the other into the perineal region, it will be found, in the great majority of cases, to be secondary to a stricture of long standing. Such a fistulous opening, even when of long duration, will, as a rule, heal as soon as the urethral stricture is properly dilated. Under the heading of Stricture of the Urethra, upon page 795, the various plans of dealing with the primary affection have been detailed, and need not be here repeated. As a rule, it will be wise to begin with solid metal bougies, passed every two or three days, until the fullest size which the urethra is capable of taking is reached.

In many instances, however, it will be found that the anterior end

of the stricture will only admit the finest instruments after much difficulty, and under these circumstances it will be necessary to begin with filiform bougies or soft catheters passed down the urethra, and coaxed into the bladder. When the bladder has been entered the instrument should be tied in, and after twenty-four or forty-eight hours a larger one may be made to take its place.

When about No. 6 English size is reached, the dilatation may be further carried out by the interrupted method of passing the larger graduated solid metal sounds, which will enable the patient to go about and pursue his ordinary avocation.

In some cases the fistula will be found to still remain open after full dilatation has been accomplished, and after waiting a reasonable time, the surgeon must resort to other methods. The cause of failure in such cases always depends upon a small quantity of urine finding its way into the fistula each time the patient makes water. This keeps the tract green, and prevents healing. As a rule, the plan of injecting irritants or caustics along the fistulous tract in such cases is bad practice, though still advised by some surgeons. The practice of tying in a large catheter in the bladder is still worse. The best procedure by far is to teach the patient to pass a large-sized soft instrument, and caution him not to attempt to make water without its aid upon *any* occasion. Even before having a motion from the bowels he should immediately pass his catheter, and draw off every drop of urine. In this way all trickling of urine along the fistulous tract is completely prevented, and in a short time complete closure results. The use of the catheter may then be discontinued.

This method will also be found to be efficacious in those cases of urinary fistula caused by prostatic abscesses.

Where two, three, or four openings lead direct from the perineum into the urethra without much induration or any diverticula, success may follow the above line of treatment. When, however, the tracts of the fistulæ are in connection with regions riddled by small abscesses, the perineum must be opened by a free external incision made over a Syme's staff for perineal section.

In those cases where from the first the stricture is impassable by any instrument introduced along the urethra, the treatment, so successful in simple cases, cannot, of course, be pursued. There is nothing left in such cases for the surgeon but to cut down upon the seat of stricture by perineal section, and by the Boutonnière operation the urethra may be divided upon a Wheelhouse's straight-grooved steel staff. In some cases Cock's operation may be performed, and the urethra divided behind the stricture, in its membranous portion.

Wheelhouse's operation is the best for most cases, and it is described along with the other methods under Stricture of the Urethra upon page 801.

The after-treatment may require the continuous use of the soft rubber catheter passed into the bladder upon every occasion by the patient

when urine is to be voided. This must be perseveringly adhered to until after the openings have entirely closed up.

The internal use of boric acid in fair doses is of great value in correcting the condition of the urine, and it is needless to say that the closest attention must be paid to diet and general hygiene.

URINE, Retention of—See Retention of Urine, page 741.

UTERUS, Diseases of.

The treatment of the different diseased conditions of the womb have already been detailed under their several headings. Thus, for the agents indicated in dealing with inflammation of the lining membrane of the organ, the reader is referred to the brief article upon Endometritis, pages 241–244. For the treatment of inflammation of the womb, he is referred to Metritis, page 508. The management of cancer of the womb will be found under Cancer of the Uterus, upon pages 106–109.

Hemorrhage from the uterus is referred to under Menorrhagia and Metrorrhagia, pages 504–506. Post-partum hemorrhage and the remedial agents used in its prevention and treatment will be found upon pages 315–318.

Ulceration of the cervix or os is generally found associated with granular degeneration, and yields, for the most part, readily to the treatment mentioned under Leucorrhœa, which is so constantly associated with it. Where these measures fail, however, as they do in some cases, the eroded surface should be touched by some strong caustic through the speculum by means of a Playfair's probe. Almost every caustic has been used for this purpose. The writer advises as a routine agent iodized phenol (1 part of iodine dissolved in 4 parts of carbolic acid). The following are efficient applications: Nitrate of silver in solid stick, nitric acid, pure carbolic acid, chloride of zinc, solution of nitrate of mercury, or of chloride of iron. Tampons of cotton wool saturated in glycerin, or, as the writer recommends, in the glycerin of borax (1 : 4) (made without water), or in the glycerin of tannic acid or of alum (1 : 6) may be used with great advantage.

UTERINE DISPLACEMENTS.

The treatment of these ailments has been a source of controversy almost as fertile as has been their pathology. The physician who believes that the displacement is the primary cause of the symptoms which are often present contents himself with the various mechanical contrivances invented to keep the uterus in its normal position.

Upon the other hand, those who regard the displacement itself as secondary to some previous mischief content themselves by seeking out the primary cause of the departure from the normal, and treating it. There are others, however, who, while fully recognizing that some

abnormal condition of the uterus always underlies the displacement, believe that, after this has been remedied to the fullest extent, the organ may require to be kept in its proper position by an accurately fitting pessary.

The writer believes that the best results in treatment will follow the use of measures directed under a proper appreciation of this last-mentioned view of the case. The subject is, however, one which can only be very briefly referred to in the narrow limits of the present volume. The treatment of *prolapse* of the uterus has been fully dealt with already upon pages 702–705.

Retroflexion of the uterus is the most common of the abnormal positions of the organ demanding treatment, though it may often exist without producing any inconvenience or symptoms.

The primary mischief should be carefully searched for; some enlargement of the uterus, the result of chronic inflammation, which has led to hypertrophy and softening of the uterine walls, may be detected.

Atthill's view may be broadly accepted—viz., that the healthy uterus will not bend.

The enlargement may be simply the result of subinvolution after profuse menstruation or parturition, and the heavy organ may assume its normal position when it becomes reduced in weight. It may be the result of a tumor growing in the interior of the organ or imbedded in its walls.

It will, therefore, be obvious that these causes should, when possible, be remedied if they still remain. Thus pain, heat, and tenderness must be met by the agents detailed under Metritis, upon page 508, if the uterus cannot be replaced in its normal position without increase of pain and discomfort.

Rest in bed, hot douches, and the glycerin tampon very speedily remove local tenderness, after which an effort should be made to replace the uterus. This is generally accomplished without difficulty by the insertion of the middle finger into the rectum, and the index finger into the vagina. Should this plan fail, the organ may be replaced by passing a sound through the os, taking care to use only *very gentle* force. The manœuvre of placing the uterus in its normal position may be repeated several times with the interval of a few days. As a rule, it will be found that it speedily resumes its abnormal position again.

A vulcanite Hodge's pessary should be inserted, the upper convex end of the instrument being lodged well behind the cervix in the posterior fornix. Speedy relief very often follows the replacement of the organ and the introduction of the pessary, which may be worn for ten or twelve weeks at a time if it keeps in position and causes no pain or discomfort. Its presence need not interfere with the constant employment of the vaginal douche.

Though it may be impossible to keep the uterus in its normal posi-

tion by this form of pessary, it is the experience of every physician that great benefit may be obtained from its use through the support which it gives to the parts. After three to six months it may be removed, and the position of the uterus carefully examined after the lapse of a few days. If the retroflexion is found to occur upon the withdrawal of the support, it must be again inserted and worn until the uterus keeps the normal position after its removal.

Innumerable modifications of the above-mentioned pessary have been introduced, some of which may occasionally be indicated under exceptional circumstances. Thus Greenhalgh's spring instrument and Albert Smith's modification may be selected. Vulcanite is, as a rule, to be preferred to gutta-percha or rubber-covered metallic pessaries. Various flexible and stiff stem pessaries have been advocated in the treatment of retroflexion, but their use had better be confined to the hands of specialists. It is, moreover, hardly necessary to say that no attempt should be made to restore the uterus to its normal position if there are reasons for believing that the organ is bound down by adhesions in its retroflexed position.

Retroversion, which generally exists to some extent in most cases of retroflexion, is occasionally met with alone. The treatment will be conducted upon the same lines, viz., the remedying of all abnormal conditions, as metritis, subinvolution, tumors, congestion, etc., and the use of a Hodge's pessary to give support to the replaced organ as just mentioned under Retroflexion.

Where pregnancy complicates the case, the retroverted organ must be carefully replaced, and the catheter used twice a day where symptoms of retention supervene.

Anteflexion of the uterus. The displacement is to be treated upon the principles already mentioned as applicable to all uterine flexions or versions. The inflammatory, congested, hypertrophied, or subinvoluted organ must be restored to a natural condition, as far as this is possible, by suitable agents, as rest, glycerin tampons, and hot vaginal douches; ergot internally, and agents employed with the view of subduing pelvic inflammation, may be necessary.

Puncture, leeching, or division of the cervix, and the regular introduction of the uterine sound have been advocated and successfully practised. Pessaries, as a rule, fail. The writer has a few times succeeded with Graily Hewitt's anteversion pessary, and he has satisfied himself that this instrument, when it does give relief, does so by steadying the uterus as a whole, or by its presence exciting some reflex action which assists in improving the tone of the pelvic floor. He has seen excellent results with this cradle pessary when inserted upside-down, both in anteflexion and retroflexion.

When inserted in this inverted way it steadies the uterus and is scarcely capable of being displaced. It is, however, most difficult to introduce and to withdraw.

Many authorities highly recommend the intra-uterine stem pessary

of rubber, or the galvanic stem or glass stem pessary, and where the rubber or gutta-percha instrument of Greenhalgh can be comfortably tolerated, it may do good. The writer believes, however, that the only cases where it probably will do good are the mild cases which will get well without any appliance whatever.

Anteversion, which is generally a direct result of inflammation of the uterus or its lining membrane, or of pelvic peritonitis, or of pelvic cellulitis, may be best treated by agents directed against these lesions. (See under the heading of each.)

When the cause has been fairly dealt with and all pain and tenderness removed, the cradle pessary just mentioned may be inserted with its convexity looking upward, as originally intended. Sometimes a Hodge seems to meet all the requirements of the case. Thomas's anteversion pessary may succeed, but, as a rule, stem pessaries should not be thought of.

Inversion of the uterus is a very serious displacement. Occurring immediately after delivery, if observed at the time, its reduction may be effected without much difficulty. The placenta should be at once removed and the organ returned to its normal position by inserting the right hand into the vagina and pushing up the uterus against the left hand, applied outside the abdominal wall.

In cases where the displacement has been overlooked for any time, the process of reduction may be very difficult, tedious, or impossible. The pressure by the hand may have a fair trial under chloroform before resorting to other methods; and if the uterus cannot be returned to its normal condition, reposition or reduction may be then tried by the use of White's reducing appliance, which consists of a disc fastened to a spiral spring by means of a curved iron rod. The disc or cup is carried up into the vagina and placed in contact with the fundus, against which it is held firmly by the hand in the vagina. The spiral coil of wire is held against the breast of the operator, on the same level as the uterus, and steady, even pressure is thus kept up upon the fundus, which gradually is reposited with the assistance of the operator's free hand applied to the abdominal wall above the pubes.

Other plans are practised, one of which is to dilate the urethra so as to admit a finger into the bladder, while another finger is introduced into the rectum, and pressure applied in this way upon the anterior and posterior margins of the depressed rim, while counter-pressure is applied to the fundus from without.

Emmet's plan is to push the fundus up until it can be enclosed by the os, which latter is then closed by sutures after paring off its margins.

The *gradual* method of reposition may be tried. It consists in introducing a rubber bag into the vagina, in contact with the fundus. Water is then slowly forced into the bag by hydrostatic pressure, and by this slow, even pressure the fundus is gradually returned.

The same principle may be carried out by using the hollow cup of Thomas, which is applied to the os, as in the case of White's repositor, but the pressure is made by elastic cords attached to the stem of the cup and to an abdominal bandage.

When all these measures fail, amputation of the inverted uterus with the knife or galvano-cautery may be resorted to.

URTICARIA—See Erythema, page 259.

VAGINISMUS.

In very mild cases the application of emollients or local sedatives may have a trial before resorting to operative interference. As a rule, however, little is to be expected from this plan if the symptoms are severe. The following may be tried:

℞.—Cocainæ purif. gr. xxx.
Morphinæ purif. gr. xv.
Unguent. conii ℥j.—M.

S.—A little to be smeared over the painful spot with the finger.

Or the following medicated pessary may be tried:

℞.—Cocainæ purif. gr. j.
Iodoformi gr. x.
Ext. belladonnæ gr. jss.
Olei theobromatis q. s.

Where speedy relief does not follow the use of these local applications, a careful inspection of the vaginal orifice should be made, and any abrasions, fissures, or ulcers should be incised or removed by knife or scissors after the application of a strong cocaine solution, or under the influence of chloroform. The remains of the hymen should be carefully cut away by the scissors.

No operative interference, however, is of any avail unless the vaginal orifice be dilated to its widest extent. This may be done by inserting the thumbs and forcibly rupturing the muscular fibres by strong traction. Afterward a *large* vaginal bougie or a glass dilator should be introduced and worn by the patient for half to one hour twice daily.

In severe cases Sims's operation must be performed. This is carried out under chloroform by making an incision two inches long upon each side of the vaginal orifice, down through the mucous membrane, and dividing the superficial part of the muscular fibres. The incision should extend from above the level of the ostium to the raphe of the perineum. The vaginal orifice is to be dilated forcibly by the fingers, and if there be much hemorrhage, the canal should be firmly plugged.

The glass dilator must be worn during healing at least once a day. In a very severe case under the care of the writer, Atthill removed entirely, with marked success, a narrow strip of mucous membrane on each side of the vaginal orifice.

VARICELLA OR CHICKEN-POX

In the vast majority of cases requires no treatment. In rare cases where the affection is severe, rest in bed and the administration of a mild diuretic, with occasional sponging of the skin with a weak alkaline solution, meet all requirements.

VARICOCELE.

Palliative measures always should have a fair trial in this condition before operative procedures are thought of, unless the case be very severe or of long standing, or where the subject of it is exposed to severe physical exertion, or where he wishes to enter into some department of the Government service.

Change of occupation has led to the disappearance of the varicose condition of the scrotal veins in several instances under the writer's notice, where the patient relinquished an occupation compelling him to stand the entire day, for one entailing a considerable amount of sitting, with some open-air exercise. In all cases the scrotum requires the support of a good suspensory bandage; constant bathing and sponging of the skin does good. The writer has satisfied himself that great benefit may be obtained by kneading the scrotum between the finger and thumb several times a day so as to excite contraction of the muscular elements. This is especially valuable in those cases where the scrotum is very lax and toneless. Lotions are of little use, as they must be covered in with oiled silk, when they soon act as poultices. The following may be sponged over the scrotum every morning before the patient begins to dress:

℞.—Hazelini	℥ iij.
Alcoholis	℥ ijss.
Aquæ dest.	℥ ivss.—M.

Constipation must be prevented, and sexual excitement and excesses guarded against. Electricity may have a trial; a weak continuous current passed through the moistened scrotal integument morning and night, combined with massage, greatly assists in improving the tone of the part. The wearing of a truss with the intention of compressing the spermatic veins in the inguinal canal is to be condemned. It may greatly aggravate the condition.

Internal agents as ergot, hamamelis, and other drugs supposed to act upon the bloodvessels are useless, but there is no doubt that any good tonic which improves the general tone will assist the varicocele to dis-

appear. Quinine, iron, and strychnine in combination, as in Easton's syrup, may have a fair trial.

Where these agents fail in improving matters, operative measures should be considered, especially if there are any signs of wasting of the testicle on the affected side.

Operative plans consist in the subcutaneous division of the enlarged veins. Lee's operation is carried out by passing two needles through the scrotum beneath the enlarged veins, at a distance of half an inch from each other, and a figure-of-8 ligature is applied over each, after which the veins between them are divided subcutaneously. Another plan is to surround the veins by a subcutaneous loop, by passing a needle armed with a catgut ligature; after tying, this may be cut close. If this latter plan be adopted, the veins may be ligatured in several places subcutaneously, and their continuity destroyed between the ligatures by cutting them across. Some surgeons excise the enlarged veins completely, while others effect their destruction by subcutaneous division by means of the galvanic écraseur.

VARICOSE VEINS

Should be treated upon the principles already detailed under Ulcers, on page 880. Support to the dilated vessels by means of a properly-applied pure rubber bandage affords by far the best treatment for this condition. The bandage should be applied from the toes to the upper limit of the varix before the patient assumes the vertical position in the morning, and it should not be removed until he lies down in bed at night. Where the skin gets tender under its use, a perforated rubber bandage may be employed, but the elastic webbing described upon page 880 meets every requirement. These appliances are vastly superior to the old-fashioned elastic stocking, which should never be recommended unless when the patient refuses to take the trouble of employing a rubber bandage. The writer has obtained good results by the application of the elastic webbing or a pure rubber bandage over an ordinary silk or cotton stocking.

Prolonged standing, the use of garters, chronic constipation, and anæmia or plethora should be guarded against, and everything calculated to improve the general health and diminish venous engorgement must be attended to.

Where these measures fail, the veins must be excised or ligatured. The best results are obtained by ligaturing the vein in several places, and dividing it between the ligatures.

VARIOLA.

The treatment of smallpox differs in no way from that of the other eruptive fevers. The principles of treatment as applied to the management of measles (pages 489–492), of typhoid fever (pages 860–876), and of typhus (pages 876–879), maintain also in the treatment of this

affection, and need not be again enumerated in detail. They have been also enumerated under Scarlatina.

The sanitary surroundings of the patient demand the most careful attention, not only on account of the highly infectious nature of the disease, but also because of the extensive suppuration. Hence the most rigid isolation and the necessity for thorough ventilation. The details referring to the choice and arrangement of the sick-room and the patient's bed should receive special care.

In severe cases, as in *confluent smallpox*, the pain in the back may be relieved by small doses of antipyrine, administered, not with the view of producing a fall in the temperature, but with the intention of obtaining t he analgesic action of the drug. For this purpose the dose should not exceed 5 grains, nor need the remedy be pushed for more than twenty-four or thirty-six hours. J. W. Moore, in his recent valuable contribution to medicine, advises for this purpose dry-cupping and the use of the India-rubber hot-water bag.

For the general condition there is no special treatment. At present we do not know of any agent possessing specific action over the disease. Antiseptic drugs have been extensively employed with the view of destroying the organism causing the fever, but it does not yet appear that any marked results have been obtained. Sansom's plan of administering the sulphite of sodium in 20 or 30 grain doses, or the sulphocarbolates in similar quantities, can do no harm ; and though they have generally failed in making any very decided impression upon the constitutional symptoms, they may possibly sometimes turn the scale in the struggle against the microbe. Yeo has forcibly shown that slight modifications in the environment of the parasite may materially modify its activity. Carbolic acid, corrosive sublimate, and salicylic acid have been extensively employed, and of the latter drug Baudon has reported successes.

J. W. Moore, as the result of his extensive experience, states that in quinine in 5 grain doses and in tincture of chloride of iron in 20 to 30 minim doses we possess the two most valuable antiseptics known, so far as smallpox is concerned. Bianchi carries out the antiseptic treatment to the fullest extent, with apparently excellent results (no deaths in ninety-six cases). He renders the surface of the patient, his bedding, room, and all his surroundings as aseptic as possible.

Various antiseptic solutions have been recommended for sponging over the body. The writer would strongly recommend inunction of the patient's skin with the oil of eucalyptus from the very commencement of the disease.

The mineral acids internally, as in the other eruptive fevers, give very good results, and in mild cases or modified smallpox should constitute the only treatment.

Alcoholic stimulants are to be administered when necessary, the indications being identical with those already fully discussed upon pages 869–872. When free suppuration occurs, stimulants in conjunction

with large amounts of concentrated nourishment must be given at short intervals.

In the hemorrhagic variety of the disease, large doses of iron and quinine must be administered by the mouth, while ergotine is given by deep parenchymatous injection, and turpentine by the bowel.

The following is the formula used by Dr. Moore at the Cork-street Hospital:

℞.—Ext. ergotæ fld. ℥iij.
Olei terebinthinæ ℥iij.
Spt. ætheris nit. ℥ij.
Spt. vini rect. ℥j.
Ovi vitellum.
Aquæ menthæ pip. ad ℥viij.—M.

S.—One-eighth part every third, fourth, or sixth hour, as required.

The treatment of such complications as headache, delirium, insomnia, and diarrhœa is already detailed under Typhoid Fever.

The *local* treatment of the eruption is of the utmost importance, especially upon the face, and there is practically no end to the list of methods recommended with the view of preventing pitting.

Stokes laid down three indications for treatment which are accepted by J. W. Moore and other authorities. He insisted upon *the exclusion of air;* the keeping of the parts *in a permanently moist state*, so as to prevent the hardening of the scabs; and the *lessening of the local irritation.*

He carried out these indications by the application of poultices—a plan which has, however, steadily diminished in favor since the introduction of the antiseptic methods of treatment.

Any unirritating antiseptic solution may be applied upon lint covered by oiled silk. Thus, boric acid (1 : 100) is a favorite application either covered by oiled silk or used as an evaporating lotion.

Weak corrosive sublimate solution (3 grains in 10 ounces) has been used by Skoda and Hebra. Carbolic lotion (1 : 80), carbolized oil (1 : 8), and carbolic pastes made with chalk and oil are highly recommended.

As a rule, thick oily preparations are more valuable than watery solutions. The writer recommends the following:

℞.—Linimenti calcis ℥vijss.
Olei eucalypti ℥iv.
Calaminæ præp. ℥j.—M.

S.—To be applied with a large camel's-hair brush to the skin of the face every two or three hours.

Tincture of iodine has been extensively used by brushing over the papules until the free suppuration stage has occurred.

Mercurial ointment, diluted with 5 to 15 parts of lard, has been tried and reported upon favorably. It is not without serious danger. A very innocent plan is to smear over the face with olive oil, and then to apply a powder consisting of equal parts of subnitrate of bismuth and prepared chalk (Hamilton, of Illinois).

Lewentauer applies upon a mask of lint an ointment consisting of salicylic acid, 1 drachm; starch, 10 drachms; and glycerin, 4 ounces.

The plan of rigidly excluding daylight from the sick-room has some advocates in America, but it is manifestly objectionable, and by no means certain in its effects. Better results may be obtained by covering the face with a mask upon which any of the previously mentioned agents is spread.

Collodion, traumaticine, gold leaf, cauterization of the vesicles by solid nitrate of silver, or their evacuation by means of a fine needle, and many other plans formerly in vogue, are not to be recommended.

Moore covers the face by a light mask of lint soaked in a mixture of iced water and glycerin (8 : 1), and covers over the mask with oiled silk.

Sprays of any of the above substances may be employed. A weak carbolic spray has many advocates, but it is difficult to see how it answers better than the lotion of the same substance.

Some authorities treat the entire cutaneous surface of the body by immersion in various medicated baths for long periods.

Borax and glycerin (1 : 6) is the best application for the mouth and throat; and for laryngeal troubles the spray of carbolic acid, mentioned upon page 831, answers all purposes. The proportion of cocaine may be increased in some cases.

Many cases of mild, modified smallpox require no treatment but rest in bed, a milk diet, a rigid isolation, with the occasional use of warm or tepid baths, and inunction with eucalyptus oil.

VERTIGO—See Tinnitus, page 841, **and Ear Diseases,** page 218.

VOMITING.

The treatment of this symptom is detailed under the various headings of the different diseased conditions which produce it. (See under Dyspepsia, Cancer of Stomach, Gastralgia, Gastric Ulcer, Gastritis, Meningitis, Bright's Disease, Intestinal Obstruction, Sea-sickness, Diarrhœa, etc.).

VOMITING OF PREGNANCY—See under Pregnancy, pages 695–698.

WARTS.

The best treatment for these growths is to apply with a piece of match-wood the strongest glacial acetic acid once a day. Where there

is a very extensive layer of epithelium, the wart should be shaved by a razor or a sharp scalpel before applying the acid, and when this is carefully done and any bleeding controlled by pressure, one application of the acid may be sufficient. Failure results through want of attention to this detail, the horny epithelium shielding the vascular tissue from the action of the acid. After the dried crust falls off or is removed the acid should be applied until entire destruction is accomplished. Saturated solution of caustic potash or the liquefied drug may be applied. It is more speedy and certain than the acid. A less painful application is that of salicylic acid in saturated solution in collodion. (See page 152.)

Fowler's solution of arsenic applied daily with a fine camel's-hair brush is a reliable wart destroyer, but the writer has found that it produces such pain after a time that often its use must be stopped. A minute quantity of arsenic made into a paste with water and applied to the wart causes its certain destruction.

Butyr of antimony, nitrate of silver, chromic acid, mercuric nitrate, nitric acid, corrosive sublimate, and nearly every known caustic has been recommended, but the glacial acetic acid answers every requirement, even in the most unpromising cases. (See also Condylomata, page 135.)

WENS—See Sebaceous Cysts, page 777.

WHITLOW OR PARONYCHIA.

Whether cutaneous, phlegmonous, periosteal, arthritic, or the result of osteomyelitis or tendo-vaginitis, should be strictly regarded as an abscess, and treated accordingly, as pointed out by Senn.

Measures should be directed to cutting short the suppurative process. Occasionally elevation of the part and the prolonged application of cold antiseptic solutions or ice succeed in producing the abortion of the disease. Where these fail to give relief, and the suppurative process is manifestly progressive, aseptic poultices should be applied as hot as the patient can tolerate.

Ordinary poultices of linseed meal, if used, should be smeared over with carbolic acid, boric acid, or other antiseptic. By keeping the finger immersed in very hot sterilized water relief is often obtained, and the progress of matter toward the skin hastened. In all the varieties of paronychia, a deep and free incision under antiseptic precautions is the only valuable method of treatment. The finger may be completely frozen by the local use of the ether spray, after which an incision down to the bone with a stout, sharp scalpel may be made without injuring or dividing the extreme finger-tip. The incised digit is to be then plunged into *cold* carbolic lotion until the effect of the freezing passes off, after which the liquid is to be heated by the addition

of boiling water until the patient cannot tolerate any further rise of the temperature.

The wound is to be treated upon ordinary surgical principles by antiseptic lotions and free drainage. Amputation is very seldom called for, the gentle removal of the necrosed bone often being followed by its reproduction within the periosteum, providing the incision has not been delayed too long, or provided the knife has been carried sufficiently deep and free.

WHOOPING COUGH—See under Pertussis.

WORMS—See Tapeworm, page 822; Thread-worm, page 830; and Ascaris, page 53.

WOUNDS.

The surgeon aims at absolute asepsis when he finds it necessary to make an incision into the unbroken skin. The various measures formerly considered to be absolutely essential in order to insure asepsis are now known to have been unnecessary, and some of them have been proved to be injurious.

The skin having been shaved and well washed with any antiseptic solution (the best is corrosive sublimate, ½ grain to 1 ounce water), the wound or incision is made by an instrument rendered sterile by immersion in carbolic acid solution (4 per cent.), or by boiling in water. The operator's hands, and especially his finger-nails, must also be treated by carbolic acid or sublimate solution, after careful washing with the nail-brush and soap.

Sponging of the wounded surfaces by ordinary sponges is to be avoided. Where these are necessary they must be disinfected after repeated washings by *prolonged* immersion in some antiseptic liquid.

Pledgets of lint soaked in very weak sublimate solution may be made to answer the part of sponges if squeezed dry before being applied to the wound. Irrigation of the wound by a stream of sterilized water or a warm, weak boric or sublimate solution is often necessary.

Hemorrhage must be completely arrested by the ordinary surgical methods and the most accurate apposition of the wounded surfaces effected by suturing, strapping, or bandaging, after providing, where necessary, for thorough drainage. Absolute rest to the part and a dressing of lint soaked in a weak solution of the previously mentioned antiseptics, or of Lister's double cyanide of mercury and zinc, should be laid upon the wound and covered with a pad of salicylic, sublimate, or iodoform gauze or wool, and kept in position by a bandage exercising a very moderate uniform pressure, after which healing by first intention may be confidently expected. In the majority of cases, if the above precautions have been scrupulously carried out, the dressing need not be disturbed for a week, by which time healing may often be found to be complete. When, however, pain, increase of tension, and constitu-

tional disturbance, especially the supervention of fever, become evident, or when the dressings become saturated with discharge, they should be removed, and new ones applied.

Accidental wounds, whether *incised*, *contused*, or *lacerated*, are to be regarded as septic wounds, and the same measures must be employed, the chief indication being absolute cleanliness. The wound must be thoroughly irrigated by sublimate solution (1 grain to 5 ounces of water); every recess must be flushed out by this liquid. Suitable drainage should then be provided, and, unless in the case of incised wounds, sutures must not be used, accurate approximation being effected by an arrangement of the dressings by strapping or by bandaging, drainage being always necessary.

Small superficial or lacerated wounds, if rendered thoroughly aseptic by carbolic acid or sublimate, may be sealed over with collodion or tinc. benzoin. comp.; the former substance upon drying causes such contraction as to firmly hold the margins of the wound together. The various lotions suitable for the dressing of open wounds may be seen under Abscess, upon page 13.

So-called *poisoned* wounds are to be treated upon the same principles as already mentioned under septicæmia. In order to effect the most complete destruction of the septic substance it may be necessary to enlarge the wound before attempting irrigation. A stronger sublimate solution (1 : 500) may then be freely applied, or powerful caustics may be used under special circumstances, as in post-mortem wounds or in bites of rabid animals. (See under Hydrophobia, page 374.)

Gunshot wounds must be treated upon the same surgical principles as ordinary wounds. The seat of injury is to be carefully and patiently explored with the finger, and when the projectile is accessible it should be removed. For the exploration and extraction it may be often found necessary to enlarge the original opening. Various forms of probes and bullet-indicators are in use, but when possible the finger is by far the best, even if its use necessitates the enlarging of the opening.

Where the bullet is not easily accessible, there is no doubt that, in the majority of cases, its removal should not be attempted. All authorities are agreed that its presence will be far less likely to produce mischief than prolonged and fruitless attempts at its removal. Free irrigation of the wound with antiseptic solutions and the establishment of the most complete drainage, if necessary by counter-openings, the application of antiseptic dressings, and absolute rest of the part and of the patient in bed, with such general treatment as the special indications present will suggest, will give far better results than repeated attemps at extraction.

The treatment of the hemorrhage (primary and secondary), of the shock, septicæmia, and other results is to be carried out by the use of the remedies indicated under their headings.

YELLOW FEVER.

There is much difficulty in detailing the treatment of a disease which varies so remarkably in its severity and termination as yellow fever. Those who have had the most experience of its treatment differ strongly upon the principles to be carried out in its management. This arises from the very marked differences of type observed in different epidemics and in different localities.

Absolute rest in the horizontal position in bed, with very free ventilation, is essential in the mildest cases, especially as very mild examples of the disease may become malignant at a later stage of their course.

The disease runs a definite course, and, in the absence of any known drug exercising a specific action, the object of the physician should be to keep the patient alive by careful nursing, judicious feeding, and by a rational treatment of the various complications or symptoms which by their presence may tend to cut life short.

Eliminatory treatment in many cases gives good results when combined with hygienic measures. Diuretics, diaphoretics, and *mild* purgatives may be used from the beginning, and, owing to the condition of the kidneys, these agents may be demanded. Bloodletting, mercurialization, and severe purging are always contra-indicated, though recently Sternberg publishes success by small doses of corrosive sublimate combined with an alkali. The mercurial is, however, in too small amount to produce constitutional symptoms. The following is his formula, very slightly modified:

℞.—Sodii bicarb. gr. vij.
Hydrarg. chlor. corros. gr. $\frac{1}{10}$.
Aquæ dest. ℥ij.—M.

S.—To be taken iced every hour.

With this treatment he affirms that he has reduced the mortality from 30 to 6.5 per cent., and he is satisfied that the alkali will give the best of all results. His object in using it is to render alkaline the highly acid urine. It prevents suppression of urine and hæmatemesis, the bichloride being added simply with the view of preventing fermentative changes in the stomach.

Mitchell reports highly of this method of treatment. He increases the strength of the mixture, using the following proportions:

℞.—Sodii bicarb. gr. xijss.
Hydrarg. chlor. corros. gr. $\frac{1}{10}$.
Aquæ dest. ℥ij.—M.

S.—To be taken every hour.

This would represent, if given hourly, rather more than 1 grain of corrosive sublimate every forty-eight hours, and it is obvious that such treatment could not be safely continued for many days.

Hyperpyrexia, as in other fevers, must be met by the cold or tepid bath, and high temperature falling short of hyperpyrexia should be reduced by cold sponging of the surface of the body.

Quinine, as a rule, is disappointing, unless malarial influences are also present. There is as yet no evidence known to the writer in favor of the new antipyretics.

The gastric disturbance generally present calls for very active measures, and it is claimed for the corrosive sublimate and sodium treatment that, if commenced early, it tends to keep this symptom in abeyance. Blisters or sinapisms to the stomach region, ice internally, with small doses of bismuth or prussic acid, may be tried. Flint restricted the diet to milk and lime-water. Stimulants are indicated in the majority of cases, and champagne may be freely given. Life has often been saved by the rectal administration of brandy and whiskey. The injection of large quantities of normal saline solution may be indicated, and, from theoretical considerations, in desperate cases the writer would recommend the intravenous injection of 2 to 4 pints of the following solution:

℞.—Sodii chlor. ℥ij.
Sodii bicarb. ℥v.
Aquæ dest. Oiv.—M.

S.—The liquid for intravenous injection.

Freire's method of inoculating has given excellent results, and, though condemned by several, the reports appear to establish its most decidedly successful prophylactic action.

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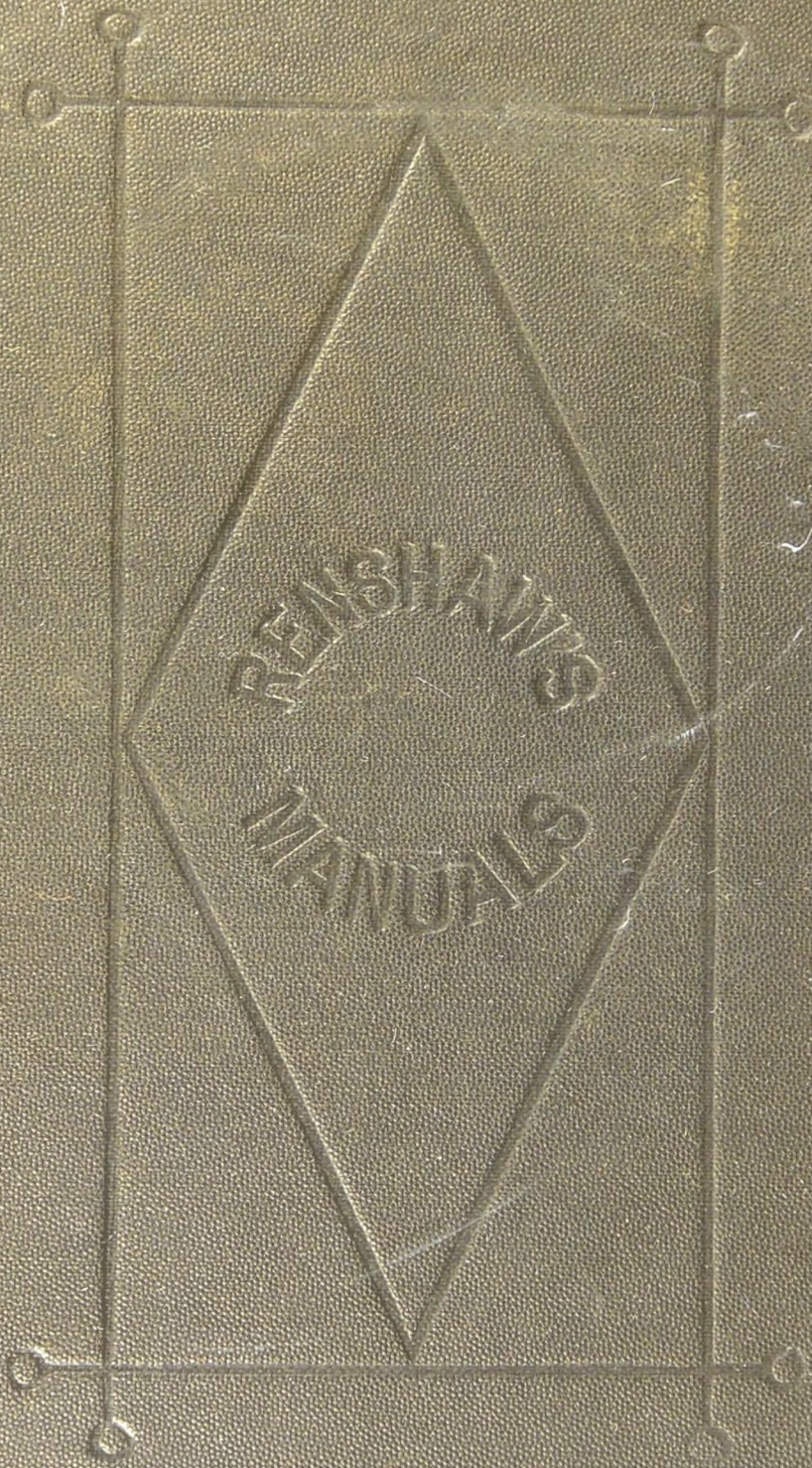
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